

WORKING PAPER 1

YEAR 2000 CORRIDOR TRAVEL DEMANDS
AND DEFICIENCIESINSTITUTE OF GOVERNMENTAL
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MAY 28 1987

Submitted to:

UNIVERSITY OF CALIFORNIA

Santa Clara County Transportation Agency

Prepared by:

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EXECUTIVE SUMMARY

The rapid population and employment growth of the past two decades has essentially saturated the transportation system of Santa Clara county. The association of Bay Area Governments (ABAG) forecasts that the county's population will grow by 16% and employment will increase 50% between 1980 and 2000. Without planning and construction of new and improved transportation facilities, the additional growth will only further negatively impact the transportation system. The long-term implications of an inadequate transportation system serving Santa Clara County are traffic congestion, prolonged delays, and potentially reduced economic development. These needs are the motivation for the Transportation 2000 study.

The Transportation 2000 study is designed to: (1) develop a technical consensus on desirable transportation improvements; and (2) to prioritize the improvements based on their relative urgency of need.

Working Paper 1 presents the findings of Task 1 of the study. It examines current land-use patterns, 1980 and year 2000 travel desires, and identifies the county's major travel corridors. It also outlines the corridor by corridor commuter travel increases between 1980 and year 2000, and identifies areas anticipated to face severe corridor congestion.

Identification of Travel Corridors.

Currently, the major job centers in Santa Clara County are generally situated in the north portion of the county while residential areas are focused in the southern portion of the urbanized area. Retail/commercial areas are distributed among the residential areas.

Commuter travel demands for 1980 and year 2000 identified by the Metropolitan Transportation Commission were analyzed to identify major travel corridors. Using this travel analysis, nine major travel corridors were established which are listed in the following table along with the low and high range of commuter travel growth between 1980 and year 2000.

It is clear from the table that the future commuter travel growth will vary between corridors and will fluctuate within the corridors. However, the currently busy corridors such as the U.S. 101, I-280 and Route 17 are expected to grow at a significant rate of increase. This growth pattern simply reinforces the belief that unless properly timed road and transit facilities are added to the system, Santa Clara County transportation facilities will fail to serve the area in future.

Corridor Travel Deficiencies.

Corridor travel deficiencies were estimated based on the presently available travel demand data for 1980 and the estimated year 2000 commuter travel forecasts. Simplified growth factors were applied to convert the year 2000 commuter travel demand to year 2000 peak hour trips.

For the available transportation system facilities, vehicles per hour per lane were utilized to estimate capacities. The travel demand and the road system capacities were then compared to determine the volume to capacity ratios. Screenline locations with volume capacity ratios above 1.0 were determined to be deficient.

RANGE OF COMMUTER TRAVEL GROWTH
BETWEEN 1980 AND YEAR 2000

CORRIDOR	LOW AND HIGH RANGE OF COMMUTER * TRAVEL GROWTH
1. Guadalupe Corridor	20,000 to 29,000
2. Fremont to Southbay Corridor	
(a) Fremont to Southbay	7,000 to 17,900
(b) Fremont to San Jose	17,700 to 29,100
3. U.S. 101 Corridor	10,700 to 40,800
4. West Valley Corridor	
(a) Existing Route 85	10,000 to 11,700
(b) West Valley Right-of-Way	
5. I-280 Corridor	6,800 to 28,800
6. Route 17 Corridor	7,200 to 29,100
7. East San Jose Corridor	
(a) North-South Section	21,300 to 26,000
(b) East-West Section	18,600 to 28,800
8. North-South Corridor	6,500 to 17,700
9. South-County Corridor	24,600

* Low and High Ranges of Commuter Travel Growth Reflects the Variation in Corridor Travel demand at different Screenlines.

Volume to capacity ratios and capacity deficiencies were determined for the following transportation scenarios.

1. 1980 travel demand on the 1980 road system
2. Year 2000 travel demand on the 1980 road system
3. Year 2000 travel demand on the 1980 road system plus Measure "A" improvements and other planned roadway improvements.

The generalized results of this analysis are illustrated in the three figures which follow and briefly summarized below.

- o 1980 Travel Demand on 1980 Road System

In the morning peak hour, almost all the corridors operate over capacity. This situation causes prolonged congestion and delays for the commuters in the urbanized area of Santa Clara County.

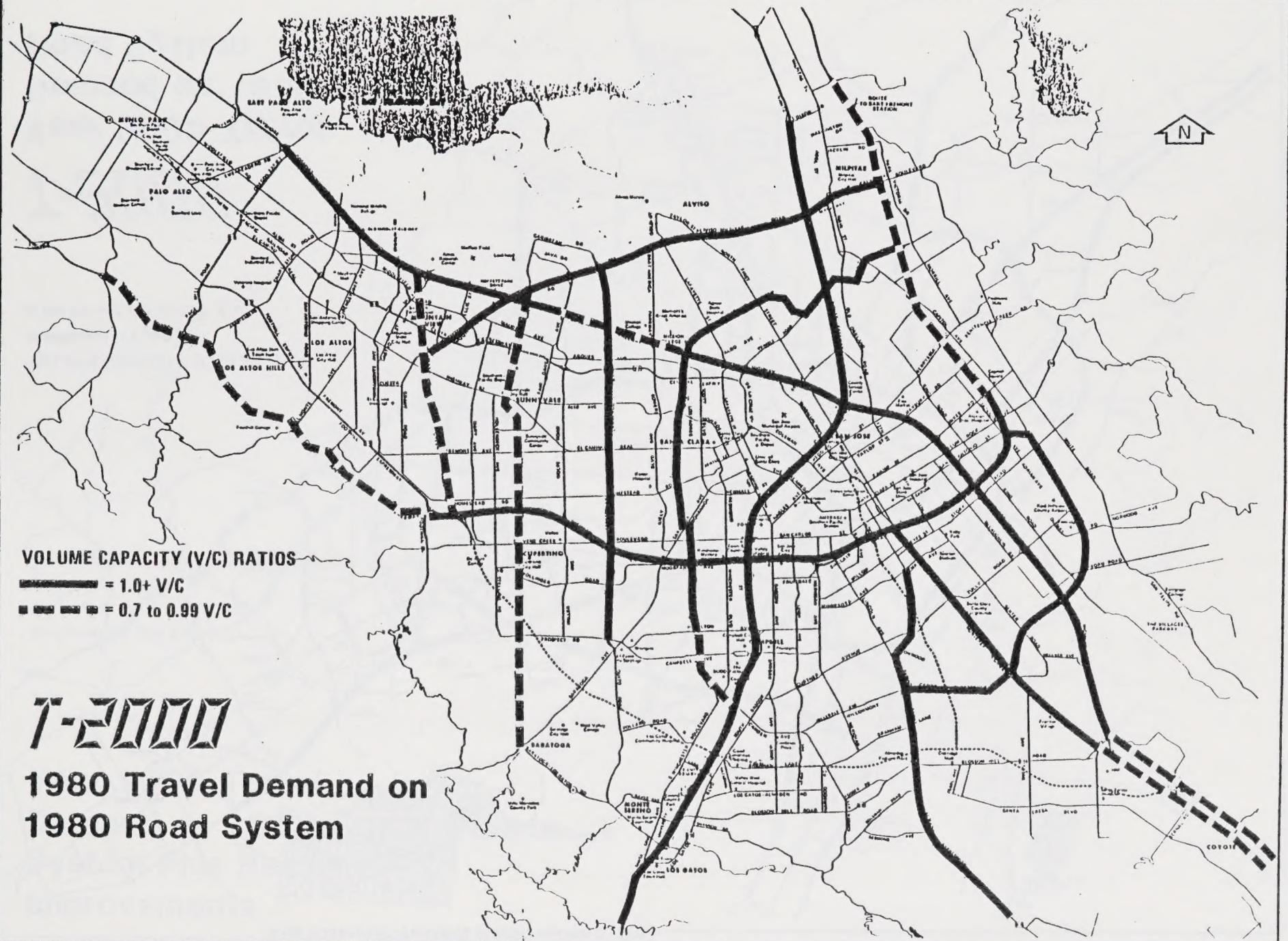
- o Year 2000 Travel Demand on 1980 Road System

As expected, if the 1980 transportation system is not improved, the situation will be much more severe than today. Every corridor will be facing traffic grid lock conditions in the peak periods which will be prolonged.

- o Year 2000 Travel Demand on Year 2000 Baseline Road System

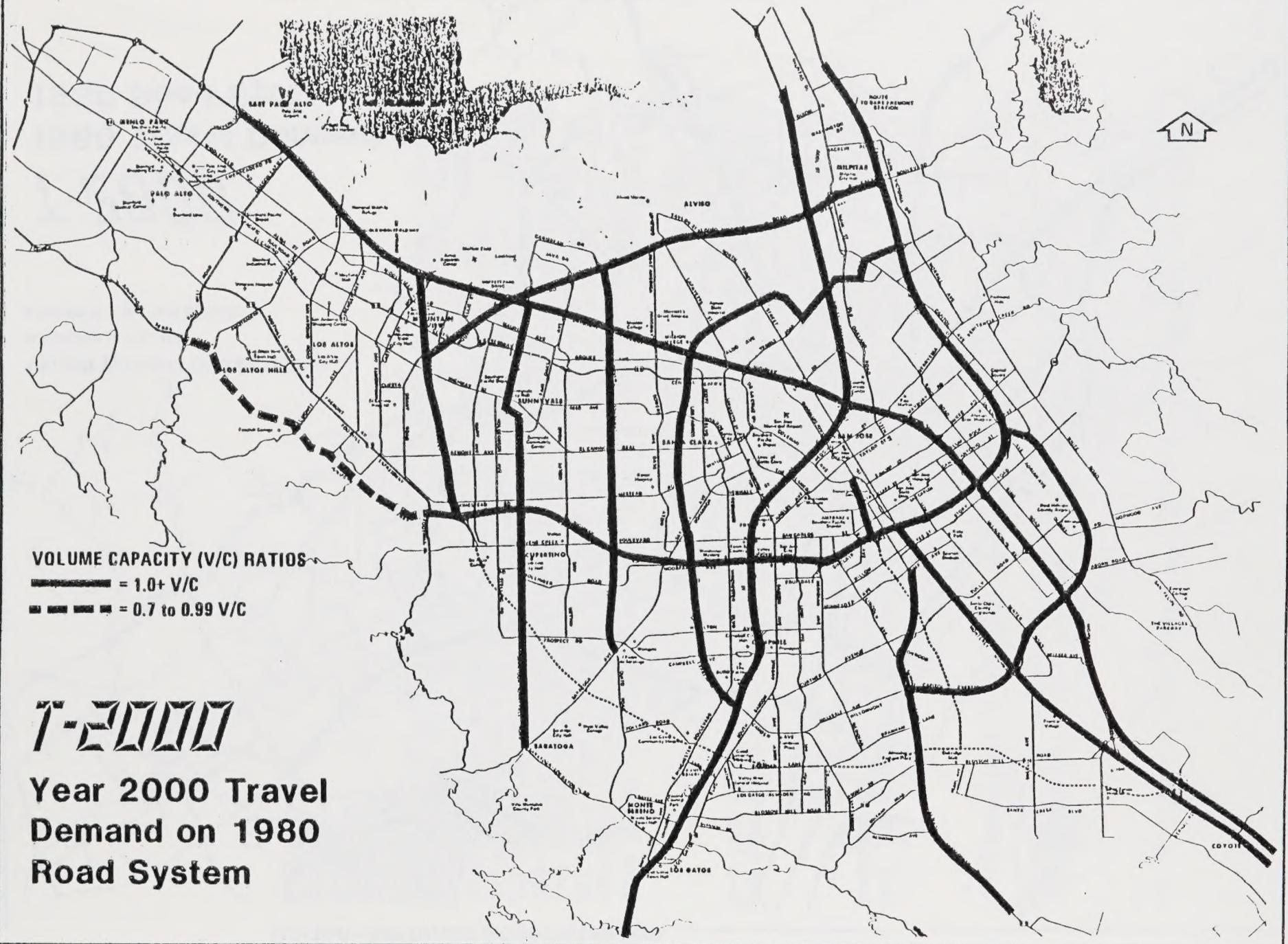
The Measure "A" improvements include the widening of U.S. 101, SR 237, I-280 and the construction of SR 85 in West Valley Corridor. Also the Guadalupe Expressway will be constructed and widening is planned for Route 17 north of U.S. 101 to the Alameda County line. The corridor volume capacity analysis indicated that even with these improvements, U.S. 101 and the Fremont to South Bay corridors will continue to face serious capacity deficiencies. Although the I-280 corridor will get some relief from the SR 85 extension, it is also expected to face a significant capacity shortfall. Therefore, it is concluded that Measure "A" and other baseline highway improvements will help but not eliminate the transportation system capacity deficiencies in the urban areas of Santa Clara County. Additional highway and/or transit improvements will be needed to accommodate the anticipated growth in travel demand.

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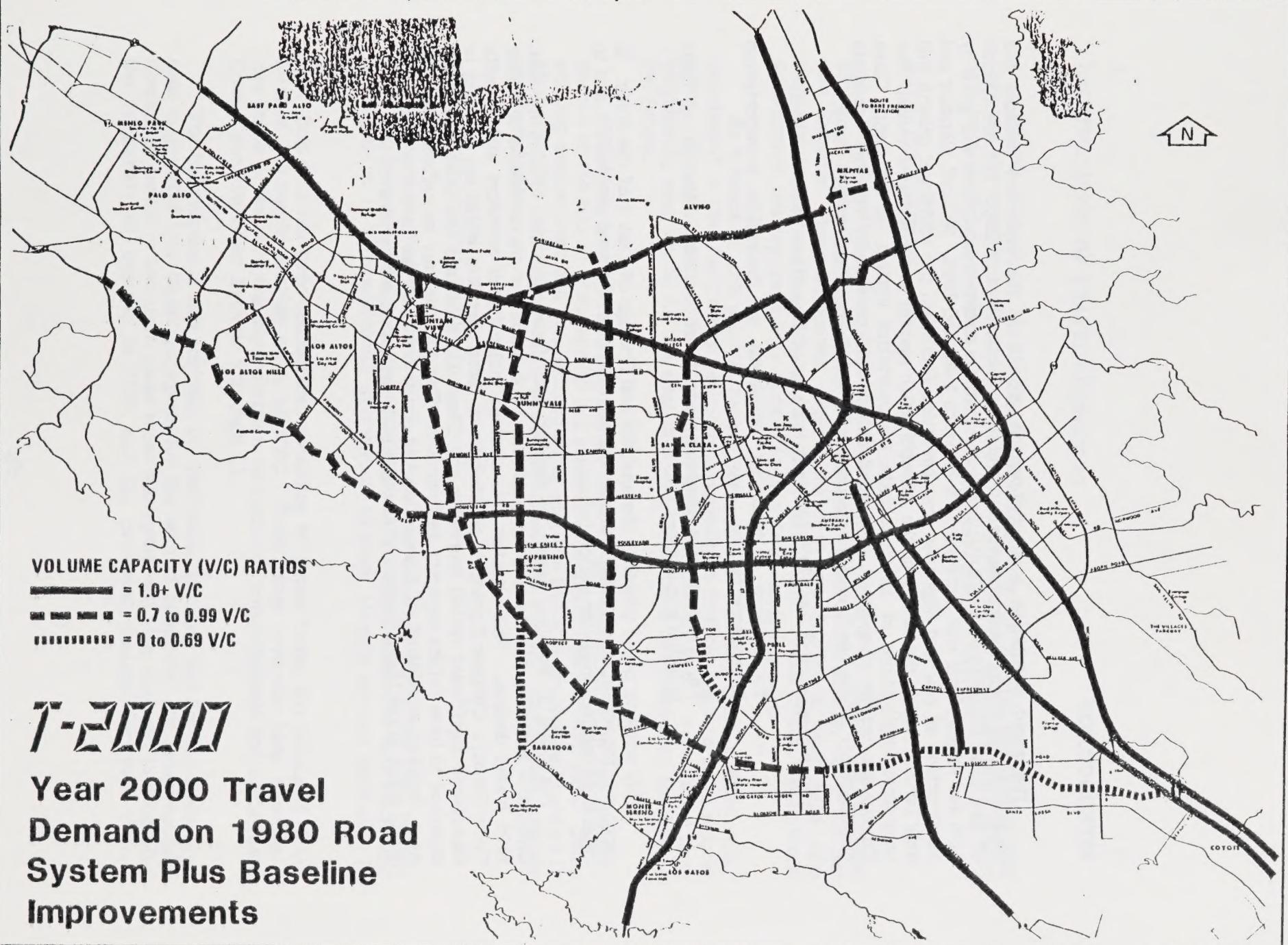


T-2000

1980 Travel Demand on 1980 Road System



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INTRODUCTION

The rapid population and employment growth of the past two decades has essentially saturated the transportation system in Santa Clara county. The association of Bay Area Governments (ABAG) forecasts that the county's population will grow by 16% and employment will increase 50% between 1980 and 2000. Without planning and construction of new and improved transportation facilities, the additional growth will only further impair the ability of the transportation system to meet travel needs. The long-term implications of an inadequate transportation system serving Santa Clara County are traffic congestion, prolonged delays, and potentially reduced economic development. These needs are the motivation for the Transportation 2000 study.

The Transportation 2000 (T2000) study is designed to achieve two objectives:

- o To develop a technical consensus on desirable transportation improvements; and
- o To prioritize the improvements based on an evaluation of their benefits and disbenefits.

This working paper presents the analysis and findings of Task 1 of the study. In summary, the objective of Task 1 is to develop corridor level travel projections and to determine corridor capacity deficiencies.

The Task 1 working paper is divided into four chapters. Following this, Chapter 2 discusses current land use patterns, 1980 commuter travel desires and year 2000 travel desires. This chapter also outlines major travel corridors within Santa Clara County. Chapter 3 presents an analysis of those corridors which are forecast to experience significant travel increases and Chapter 4 discusses the areas which are expected to have future capacity deficiencies. This analysis may be refined based on more detailed simulation of travel flows in Task 4, but serves in the meantime as useful input to the identification of alternative transportation investments.

2.

IDENTIFICATION OF TRAVEL CORRIDORS

Travel corridors in any urban area are formed by the location and type of land uses and the available transportation facilities. This chapter discusses these factors and the major travel corridors which have been identified for analysis.

LAND USE PATTERN

The urbanized areas of Santa Clara County consist of fifteen jurisdictions, almost all of which are located in the northern portion of the county. Over the last two decades, these urbanized areas have been growing at a rapid rate with employment increasing more rapidly than population. The retail commercial development has kept pace with demand to provide necessary support.

As a result of this growth, Santa Clara County currently faces a "job-housing imbalance" in that the County has more jobs available than the labor force to support them. The net result of this imbalance is the importation of work force from neighboring counties to fill the available jobs. This trend is expected to continue in the future.

Within the county itself, major job centers are concentrated in the northern portion of the county while residential areas are located in the southern part. These existing employment and retail/commercial land use patterns are generally shown in Figure 1. The remaining portion of the urbanized area contains mainly single family residential units.

COMMUTER TRAVEL DEMAND

Journey to work data for the Bay Area was collected during the 1980 census. The Metropolitan Transportation Commission has since analyzed the data and supplemented it with additional information obtained through surveys conducted in 1981.

This data has been summarized according to census tracts and tabulated in the form of 550 traffic analysis zones by MTC. These zones have also been aggregated into larger areas known as super districts to facilitate comprehension and Santa Clara County contains super districts 8 through 14.

For the purpose of this analysis, the Peninsula, Southbay and Eastbay areas have been aggregated into three subregions for the sake of simplicity and understanding. Commuter travel to and from these three subregions was then analyzed to determine the magnitude of demand in 1980 and the projected demand for year 2000.

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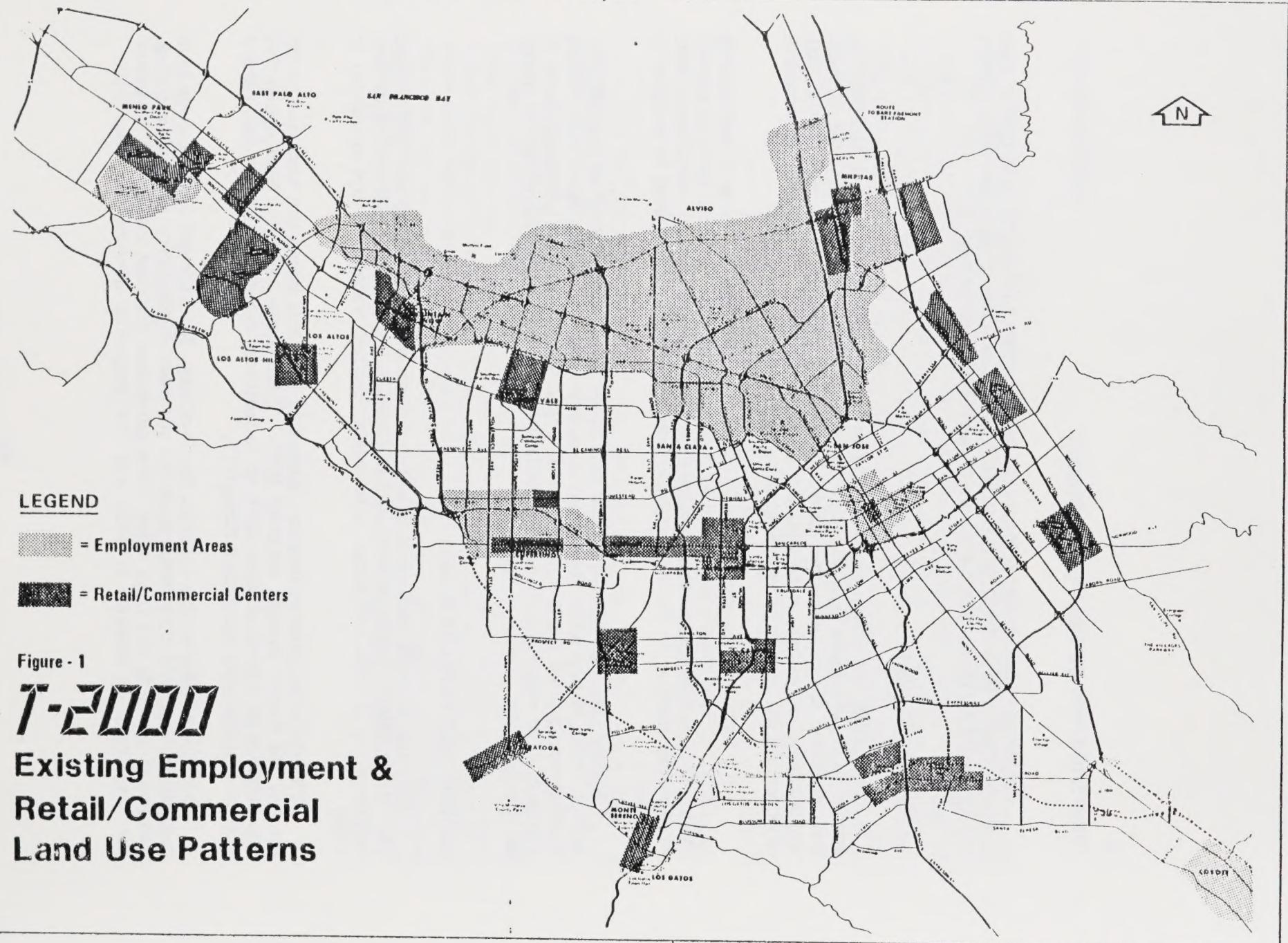


Figure - 1

T-2000

Existing Employment & Retail/Commercial Land Use Patterns

Figures 2 and 3 present the commuter travel between the Peninsula and the Santa Clara County super districts (irrespective of travel facility). These illustrations indicate that total two way travel demand across the northwestern county boundary will increase by about 24%. Incoming commuter demand will increase by 36% signifying a net import of workers from the Peninsula.

A similar analysis of Eastbay travel indicates that 39,900 commuters were crossing the county line in 1980, and by year 2000 this number will increase to 69,300—a 74% rise. The major part of this increase (85%) will be southbound commuters from the Eastbay. The distribution of these commuter trips are shown in Figure 4 and 5.

Intra-county commuter travel within the Santa Clara County (on a super district basis) is shown in Figures 6 and 7 for 1980 and year 2000 respectively. In this case, the largest increases will occur between super districts 9 and 8, 9 and 12, 9 and 10, and 9 and 13. As super district 9 has the county's major employment base, travel between this employment and residential areas is expected to grow significantly.

IDENTIFICATION OF TRAVEL CORRIDORS

The commuter travel demand patterns discussed above provides an overview of the growth in commuter travel and implicitly establishes travel desire corridors within Santa Clara County and to the Peninsula and Eastbay. This information, coupled with a knowledge of existing and planned transportation facilities, enabled the study team to identify major travel corridors which are described below and illustrated in Figures 8 through 16.

1. Guadalupe Corridor

This corridor is based on the premise that the Guadalupe Light Rail System and the expressway will be constructed by 1989. This corridor also includes Almaden Expressway and Monterey Highway and is delineated in Figure 8.

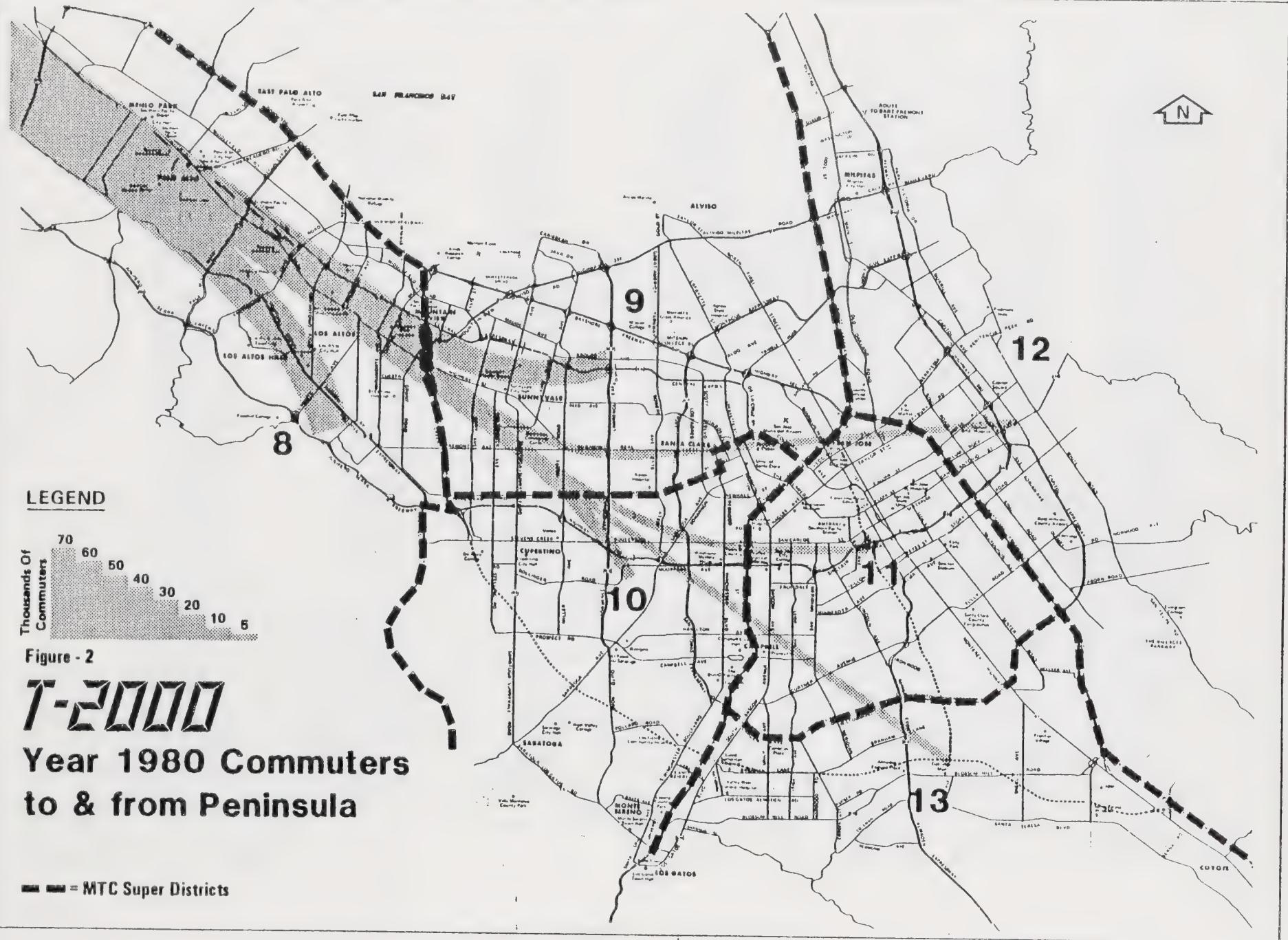
2. Fremont to Southbay Corridor.

This corridor has been identified by another study which has preliminarily examined transportation alternatives between the Fremont BART station in Alameda County and the Southbay. As noted earlier and shown in Figure 5, this corridor is expected to experience significant increases in commuter travel by year 2000. This corridor contains Route 17, I-680, Route 237 and Route 101. It is depicted in Figure 9.

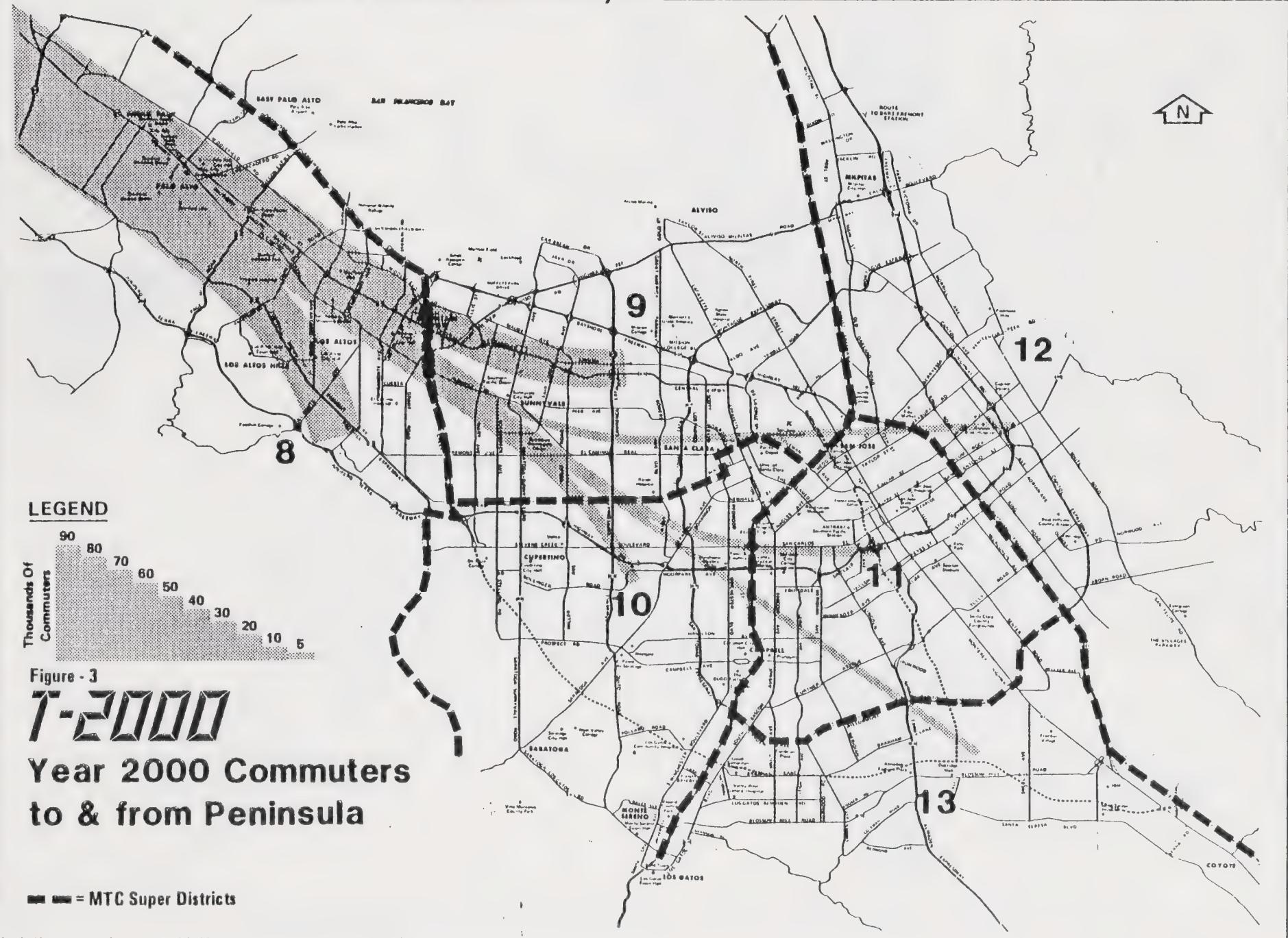
3. U.S. 101 Corridor.

This is perhaps the most heavily traveled corridor in Santa Clara County. It contains Route 101, the CALTRAIN/SP commuter rail line, the Central Expressway, El Camino Real and Monterey Highway. It traverses the entire urbanized portion of Santa Clara County and passes through five cities. It is shown in Figure 10.

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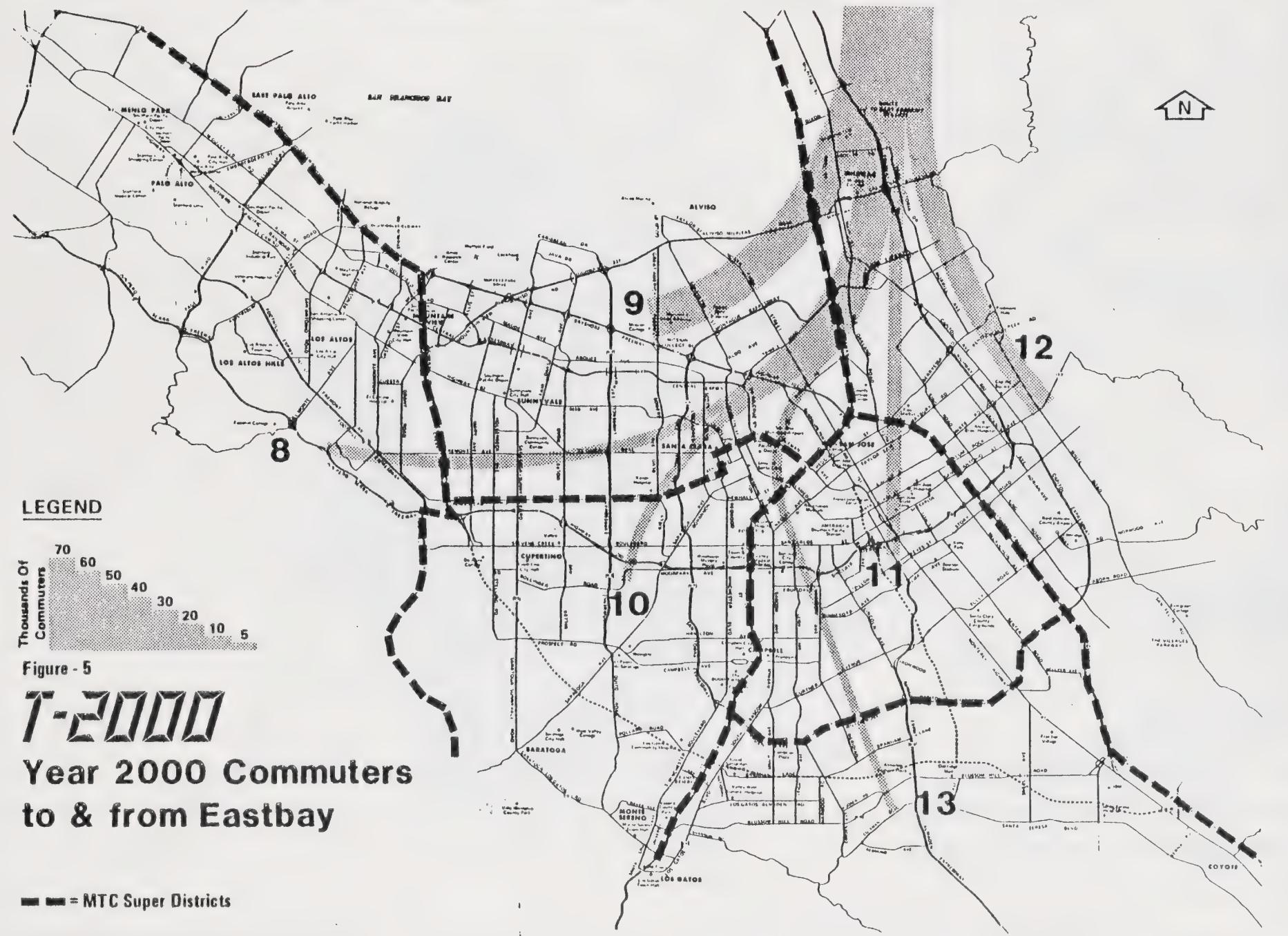
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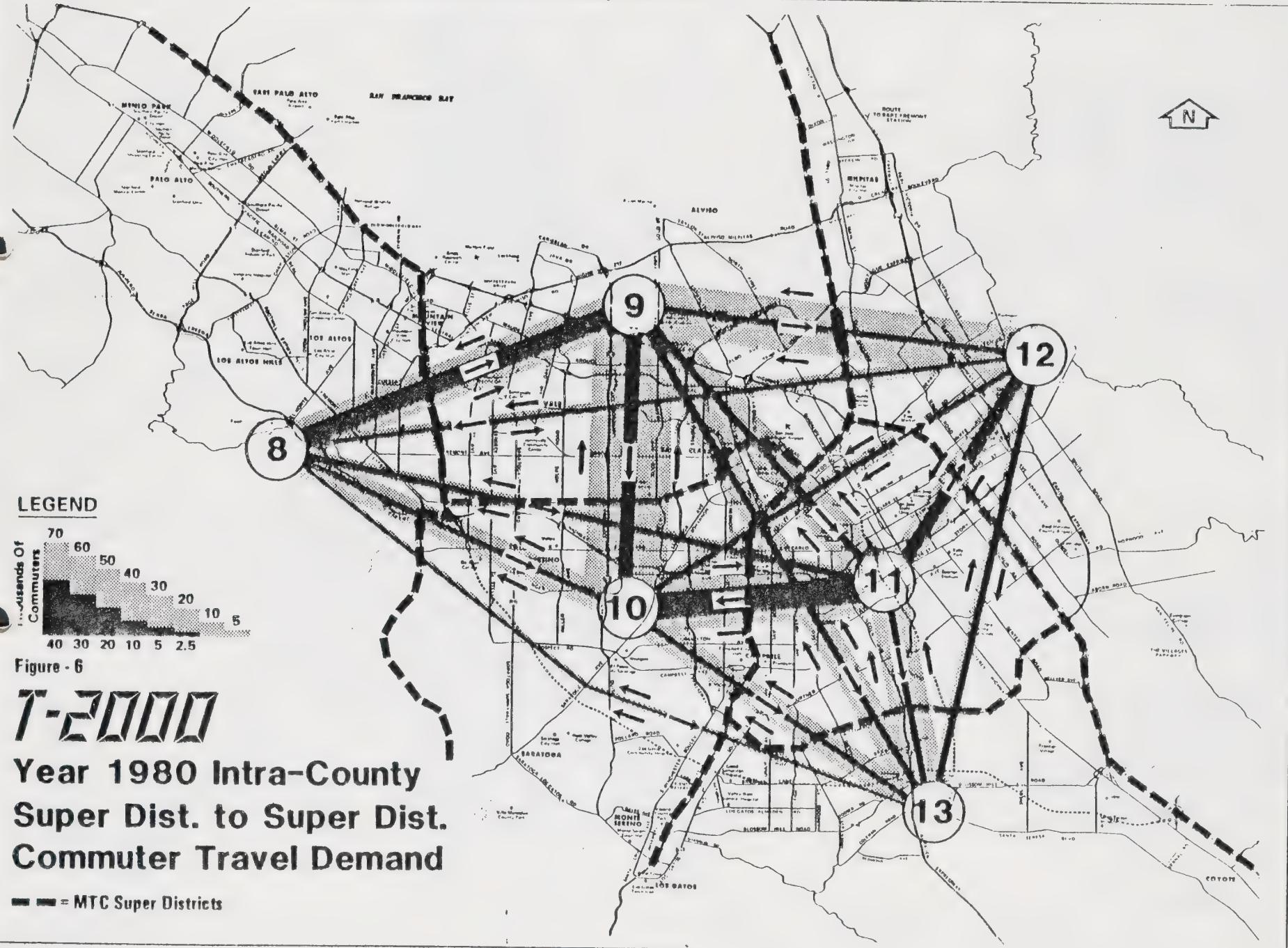


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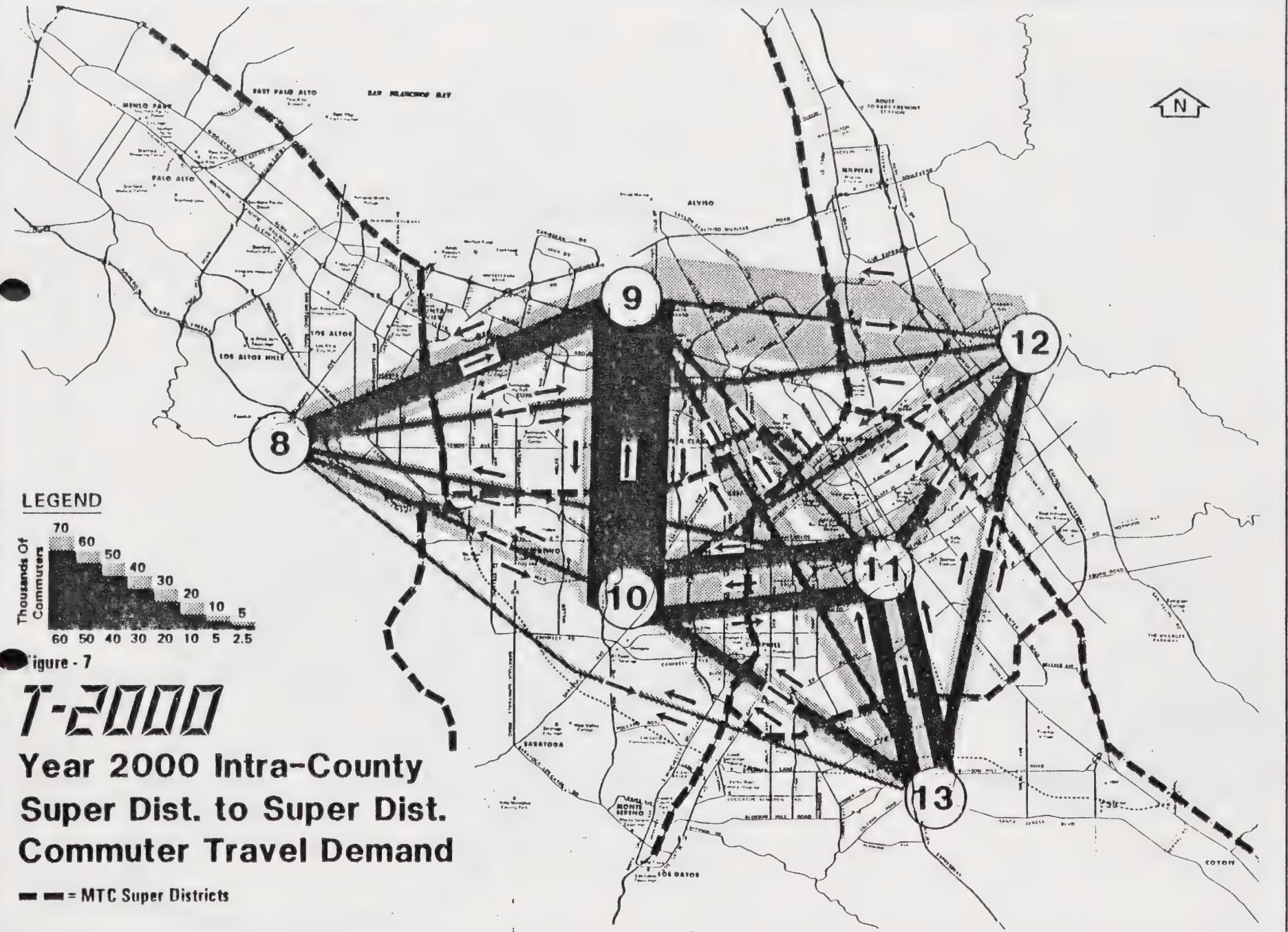


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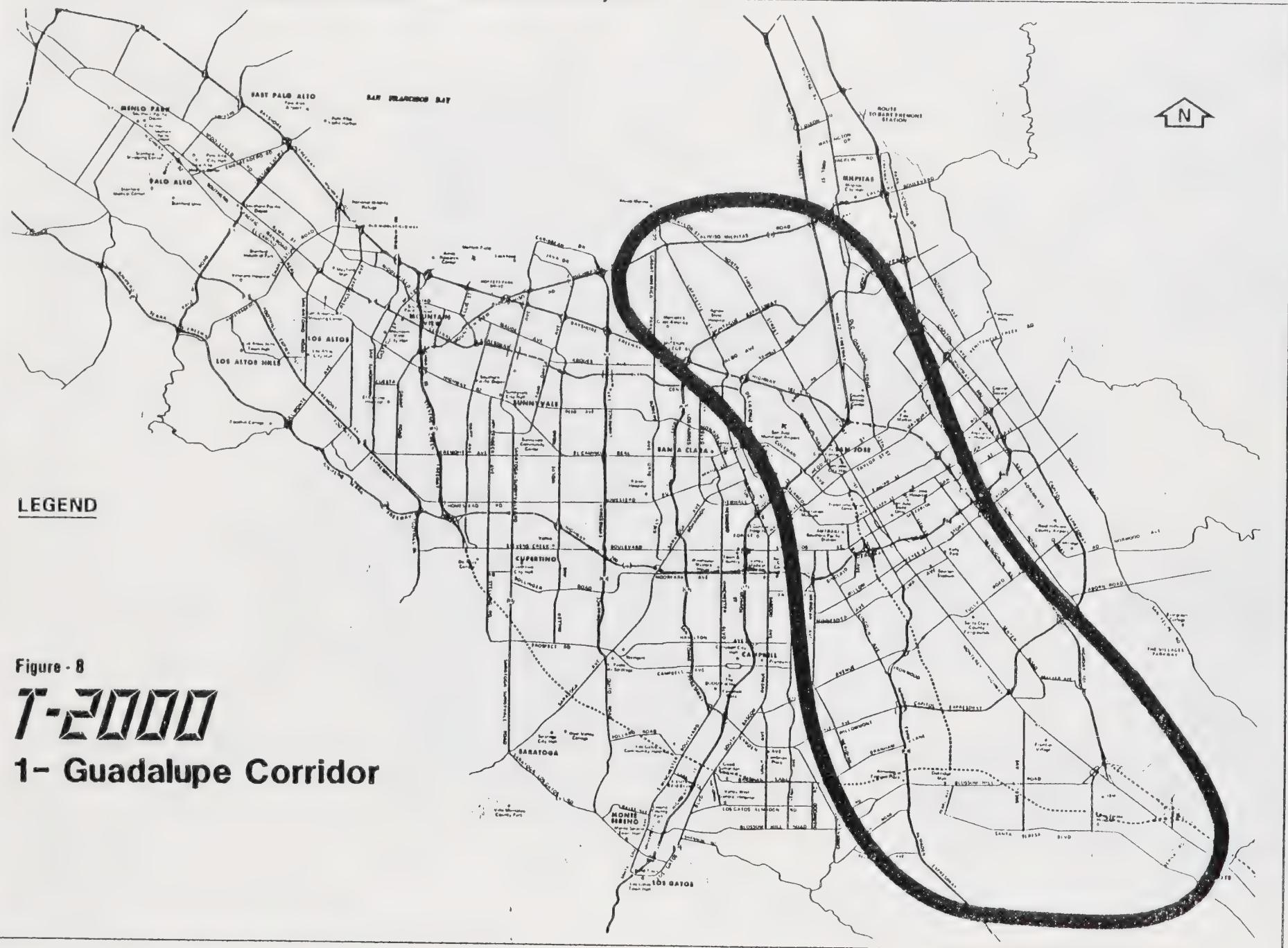




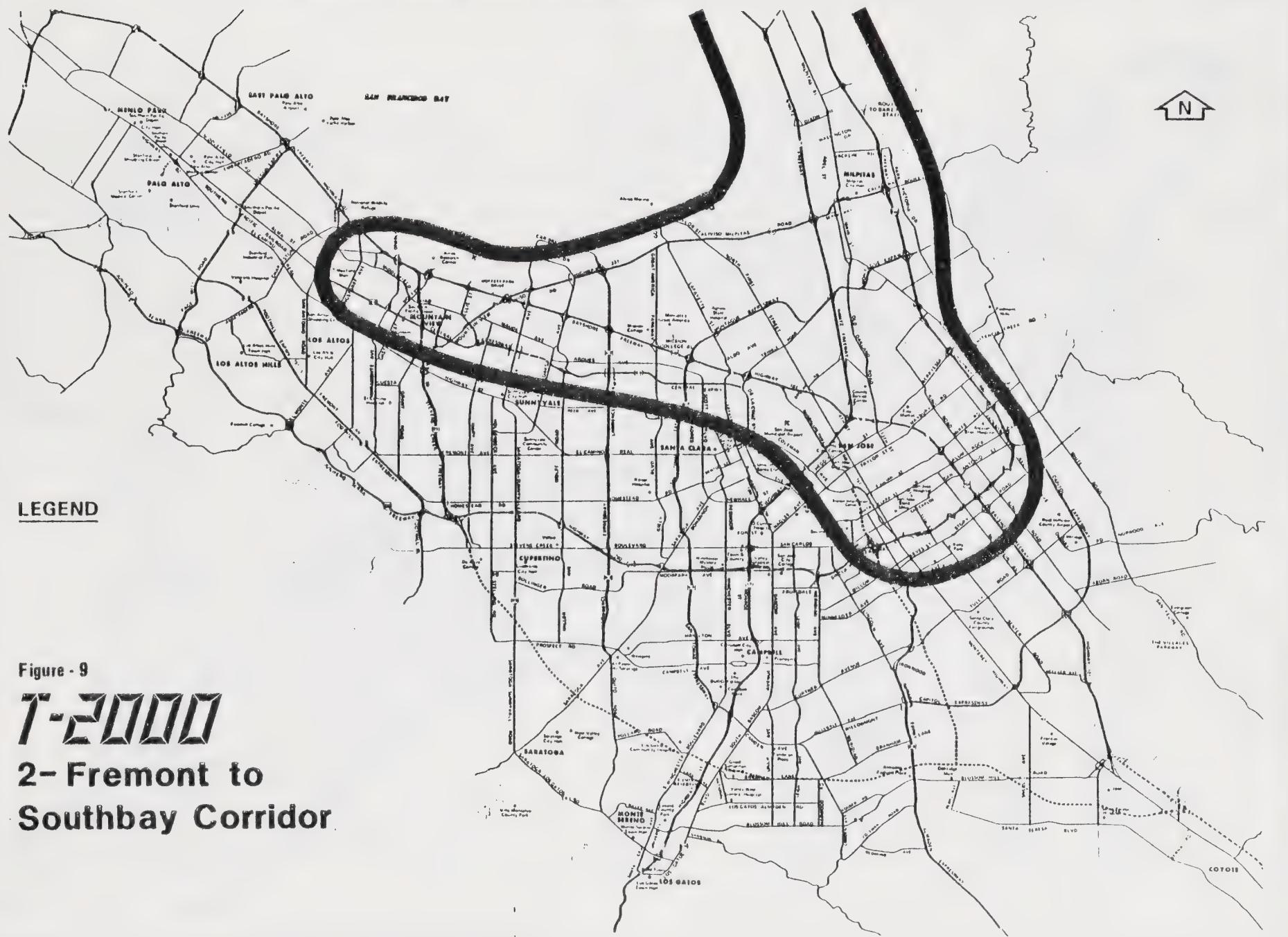
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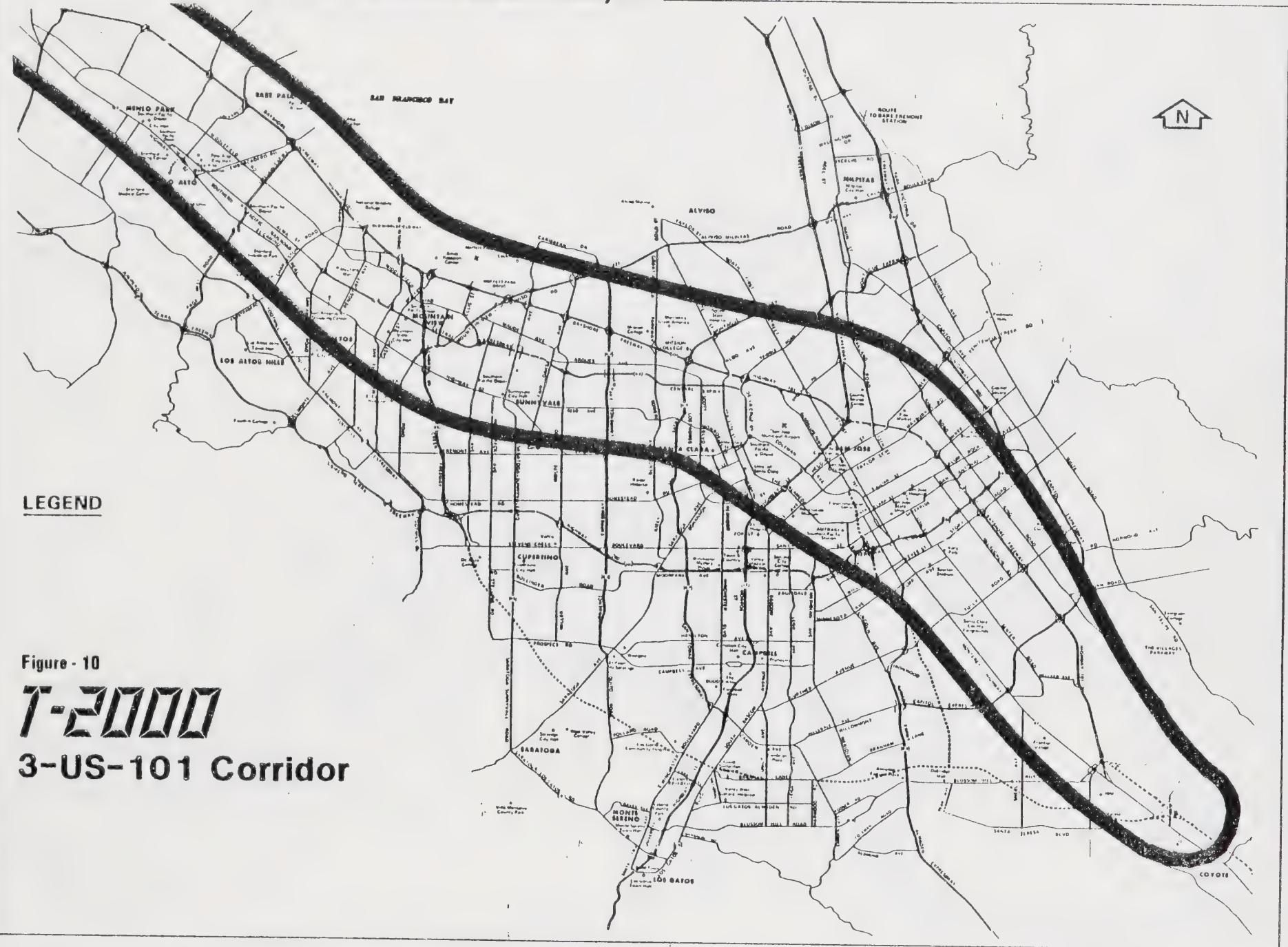
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4. West Valley Corridor.

The West Valley corridor consists of two elements. The northerly part of the corridor contains the Route 85 freeway and the arterial roadways Mary Avenue and Saratoga-Sunnyvale Road/Mathilda Avenue. The southerly part (south of I-280) contains the right-of-way generally known as the West Valley transportation corridor.

In length, the corridor is second only to the U.S. 101 corridor. It passes through 5 cities and would connect the major employment centers in the north to the residential areas in the west and south portions of the county. It is shown in Figure 11.

5. I-280 Corridor

The I-280 freeway passes through the middle of the urbanized areas of Santa Clara county in the east-west direction. In addition to I-280, it contains the Foot Hill Expressway in the west, Stevens Creek Boulevard in the middle and Julian Street, Alum Rock Avenue and Story Road in the easterly part of the corridor. The location of these facilities and the corridor are illustrated in Figure 12.

6. Route 17 Corridor (I-680)

In this corridor, Route 17 is the only freeway, stretching from Milpitas in the north to Los Gatos in the south. Major arterials in this corridor include Winchester Boulevard and Bascom Avenue in the south, and Old Oakland Road in the northerly section. It is a major linkage between Santa Cruz, Santa Clara County and the Eastbay and is shown in Figure 13.

7. East San Jose Corridor

By traditional definition, this is not a "corridor" as generally evaluated in transportation analyses. It is however an area in need of transportation investment. It contains a large triangular shaped area of east San Jose which stretches from the foothills to the Guadalupe corridor in central San Jose. Due to its shape, it includes north-south facilities as well as the east-west facilities. Major north-south facilities include White Road, Capitol Avenue/Capitol Expressway, King Road, the southerly portion of I-680, and a section of Route 101. East-west facilities include Berryessa Road, Mayburry Road, McKee Road/Julian Street, Alum Rock Avenue/Santa Clara Street, San Carlos/San Antonio Street, Story Road and Tully Road. The boundaries of this "corridor" are illustrated in Figure 14.

8. North-South Corridor.

One of the most heavily traveled corridors within the Santa Clara County is formed by Lawrence Expressway, Kiely Boulevard, San Tomas Expressway and Wolfe Road. (See Figure 15). Due to its orientation, it connects the residential areas of Saratoga, Monte Sereno, Los Gatos, Campbell, San Jose, Santa Clara (city) and Sunnyvale with the major employment centers north of the Central

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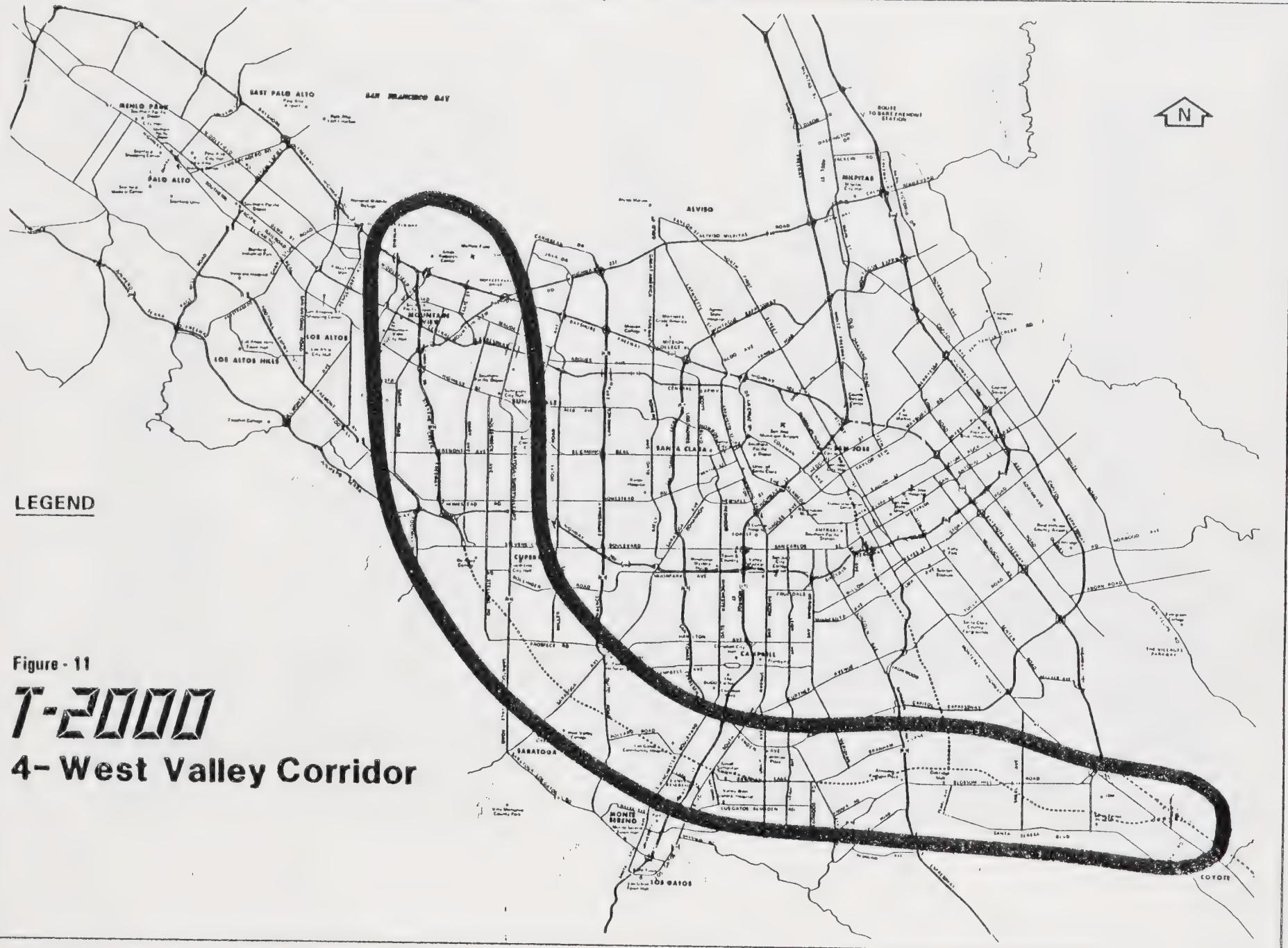


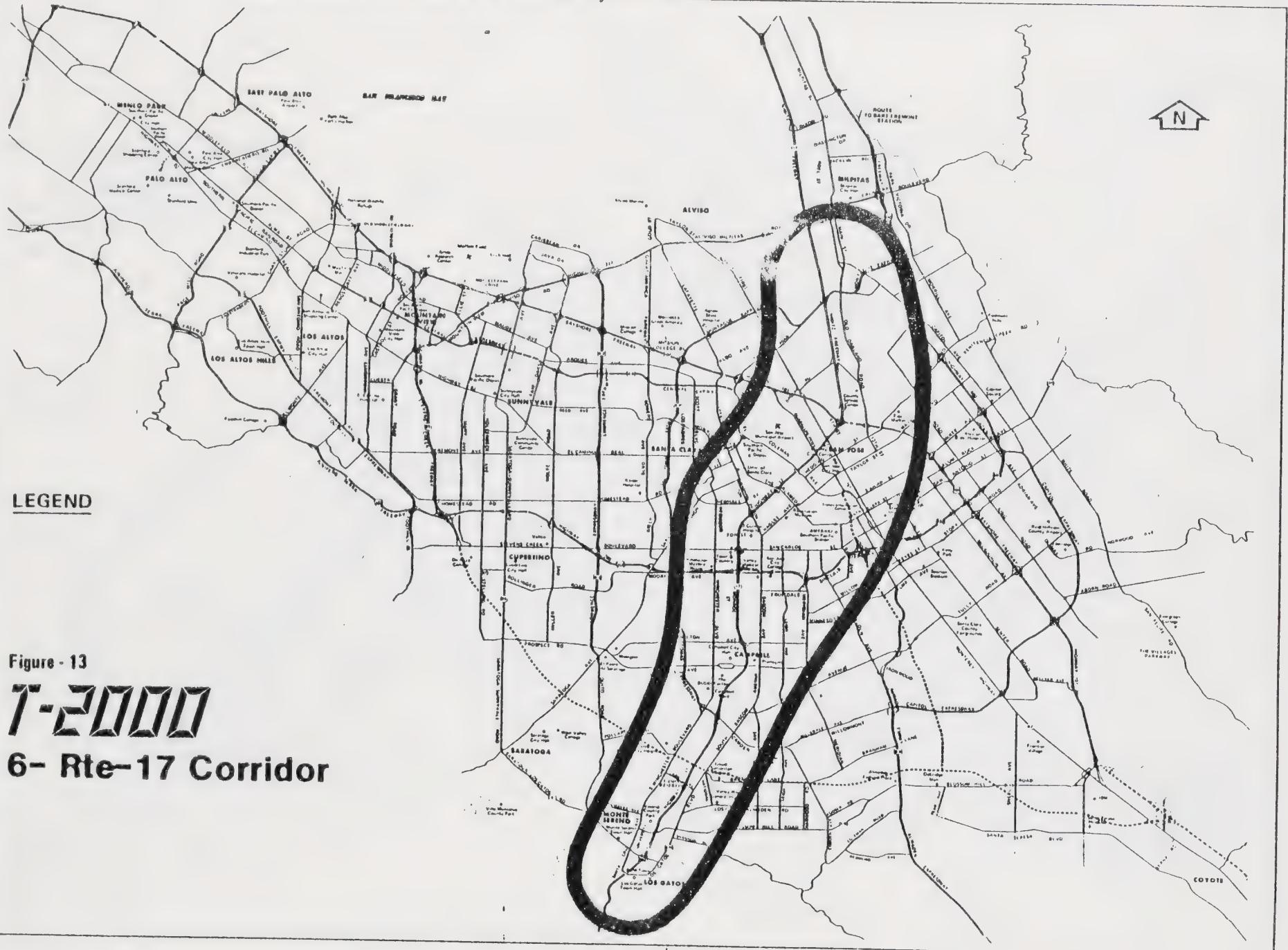
Figure - 11

T-2000
4- West Valley Corridor

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Expressway. To some extent, Saratoga-Sunnyvale Road/Mathilda Avenue are also part of this corridor; however, in order to limit its width, this facility has been included with Route 85 in the West Valley corridor.

9. South County Corridor.

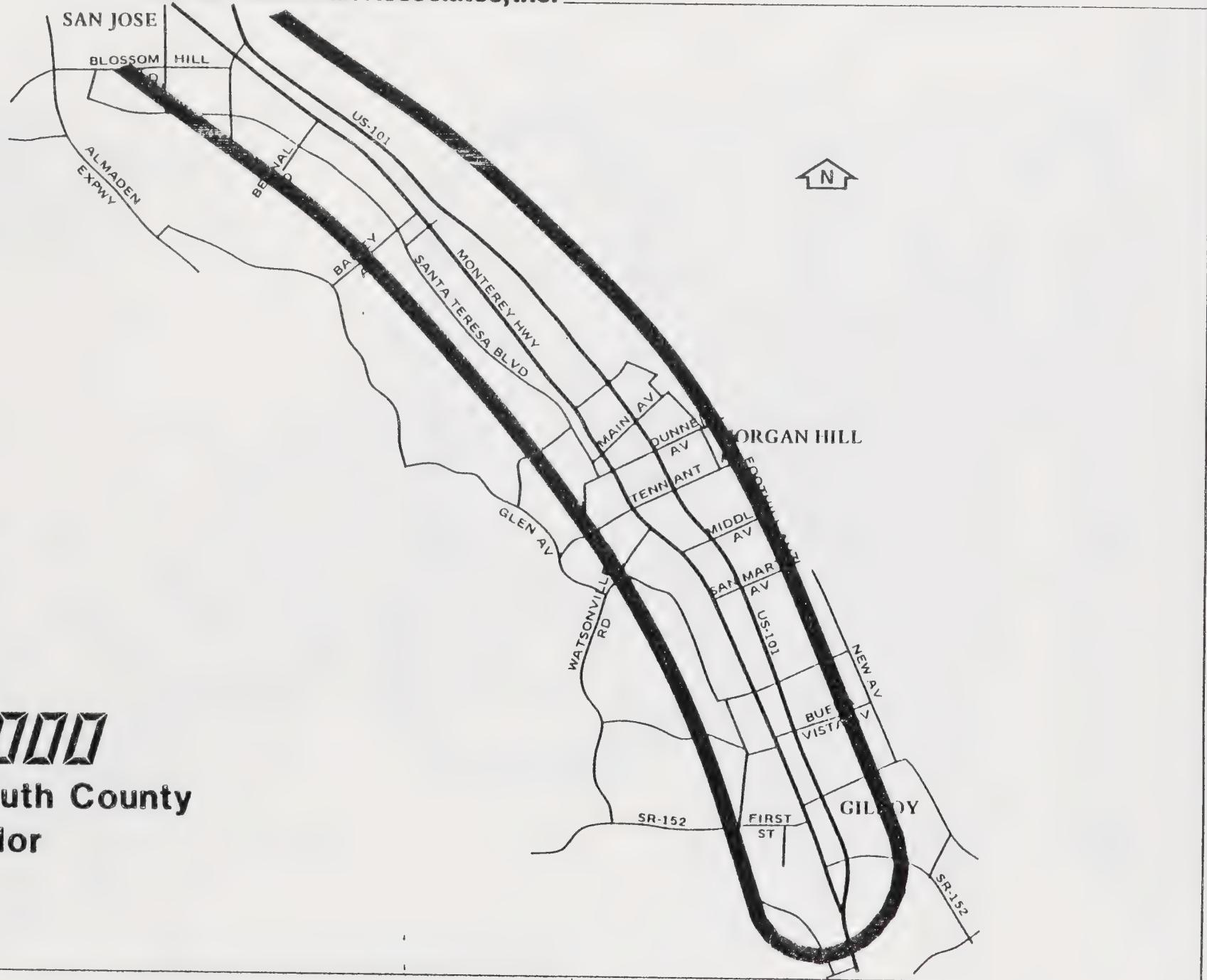
The South County corridor runs south-east of San Jose along Route 101. It contains U.S. 101, Monterey Highway and portions of Santa Teresa Boulevard. Also included in this corridor are the Southern Pacific railroad tracks that parallel Monterey Highway. This corridor links Santa Clara County with Santa Cruz County and San Benito County. It is illustrated in Figure 16.

Taken collectively, the corridors identified above include all of the major transportation facilities existing or currently proposed for the urbanized portion of Santa Clara County. They also encompass all concentrations of employment, commercial and residential activity.

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LEGEND

Figure - 16

T-2000

**9- South County
Corridor**

3.

1980 TO 2000 COMMUTER TRAVEL GROWTH BY CORRIDOR

The 1980 and year 2000 commuter trip interchange data obtained from MTC was assigned to the nine travel corridors described in the previous chapter as appropriate. These corridors were divided into a number of check points, generally known as "screenlines", to determine the variations of commuter travel along each corridor.

Screenlines were selected at locations where the travel movement was expected to vary due to the intersection of major facilities as these would add or take away traffic from the corridor.

This analysis was conducted at a preliminary level of transportation "network detail" in order to determine the magnitude of relative growth of commuter travel desires between 1980 and the year 2000. These figures should not be taken as daily trip assignments. There are strictly unconstrained commuter travel desires along each of the corridors.

The corridor increases by the year 2000 simply indicate the size of commuter travel growth in comparison to 1980. Knowing the present travel congestion problems along these corridors, one can readily perceive that anticipated increases in traffic volumes will result in delays and congestion provided that corridor travel facilities are not improved to add additional capacity to the system.

Additional information is presented in the following chapter to identify corridor capacity shortfalls. These will be refined during Task 4; however, at this time, a preliminary analysis of this nature is useful to understand the magnitude of the future commuter travel desires.

The 1980 and year 2000 commuter travel demands are discussed below for each of the corridors.

1. Guadalupe Corridor.

This corridor extends from Route 237 to Blossom Hill Road. Three screenlines were selected at Montague Expressway, I-280 and Capitol Expressway to assess the variations in travel desires along the corridor. The commuter travel is shown graphically on Figure 17. It is clear that the highest increase (68%) will occur between Route 237 and Montague Expressway. The other two check points show increases of 42% and 36%.

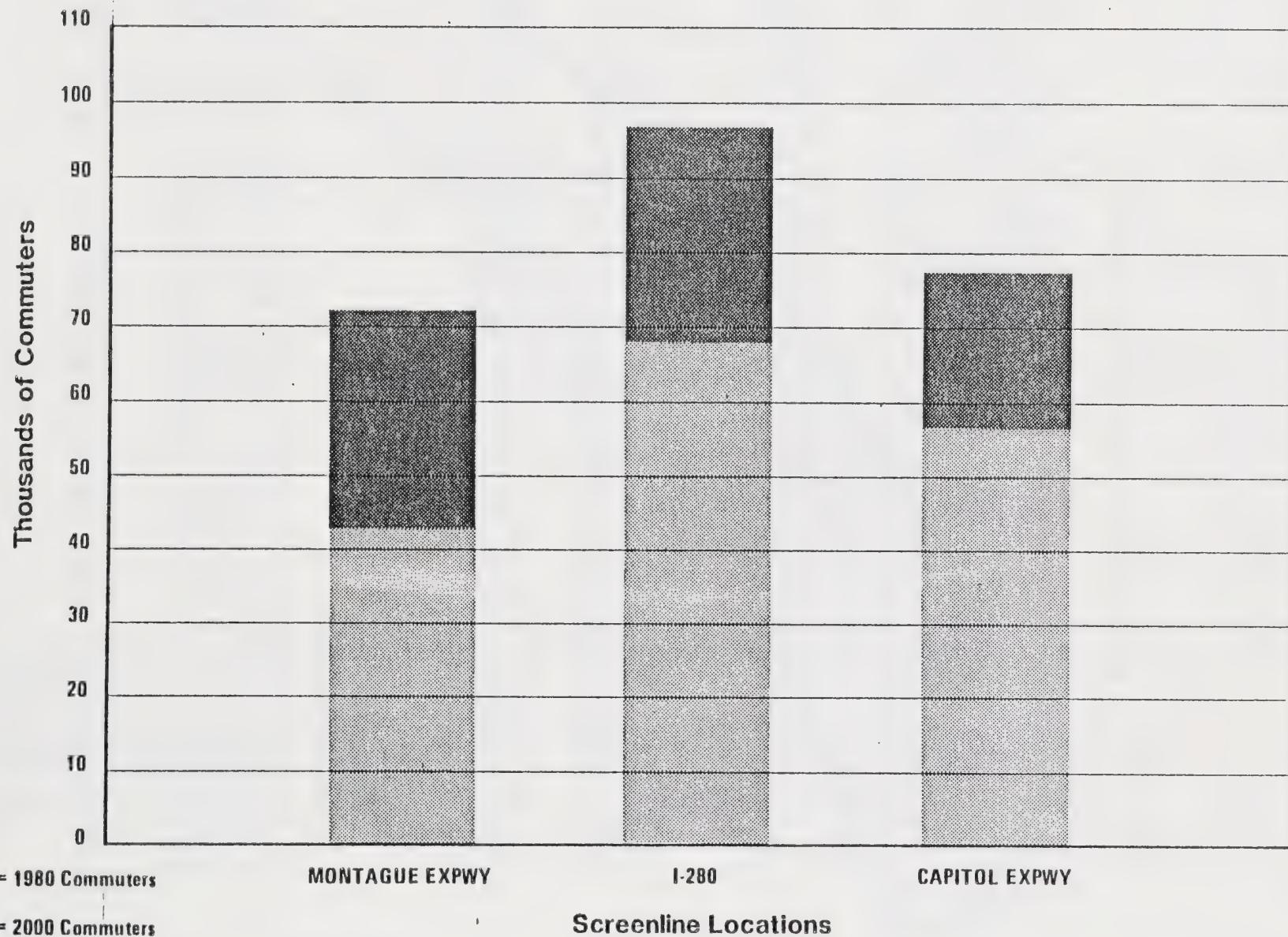
The construction of Guadalupe LRT and expressway will supplement the available capacity and help to alleviate future travel problems.

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COMMUTER TRAVEL GROWTH – SELECTED SCREENLINES

Figure - 17

1- Guadalupe Corridor



2. Fremont to Southbay Corridor.

Due to its configuration, this corridor was divided into two sub-corridors. The first one is described as Fremont to Mountain View and the second as Fremont to San Jose.

a) Fremont to Mountain View Sub-Corridor

The screenlines in this corridor were established at the Guadalupe River, Fair Oaks and Ellis Street. Figure 18 shows the 1980 and year 2000 commuter travel along the sub-corridor. The largest increase (60%) will occur west of Guadalupe River mainly because of residential growth in Alameda and Contra Costa Counties. The large number of 1980 and year 2000 commuters west of the Fair Oaks screenline are due to the inclusion of U.S. 101 in this corridor. If U.S. 101 commuters were not included, the numbers would be much lower at this screenline.

Due to heavy automobile travel demand, this corridor is currently subjected to serious congestion and prolonged delays. Further travel increases will only worsen the situation to a point where traffic will stand still in the peak periods unless additional road and transit facilities are added to relieve the present congestion and provide for future demand.

b) Fremont to San Jose Sub-Corridor

The 1980 commuter demands across Tasman, Montague, Julian and Berryessa are in the range of 40,000 to 46,000. The year 2000 increases are the highest (68%) between Tasman and Montague and between Montague and Julian (63%) as shown in Figure 19.

Route 17 is already heavily congested and I-680 is approaching a similar level of congestion. Without any relief, delays will reach intolerable levels in the near future, and beyond to the year 2000.

3. U.S. 101 Corridor.

Being one of the busiest and longest corridors, this corridor suffers ongoing congestion for most of the peak periods. Other than U.S. 101, all other roadways in the corridor are not continuous, therefore Route 101 carries significant proportion of short trips as well as long trips. Year 2000 commuter travel growth varies along the corridor with the highest growth taking place between I-280 and Capitol Expressway. In this section, the 1980 commuter demand of 53,800 will grow to 94,000, an increase of 76%. Similarly, the section between Capitol Expressway and Blossom Hill will increase by 31,600 commuters (105%).

4. West Valley Corridor

In actual length, this corridor is about as long as the U.S. 101 corridor. Currently, only one quarter of the corridor actually exists in the form of Route 85. Much of the remainder of the corridor is in the form of right-of-way set aside for future use.

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COMMUTER TRAVEL GROWTH – SELECTED SCREENLINES

Figure - 18

**2a- Fremont to Southbay Corridor
(Fremont to Mountain View Section)**

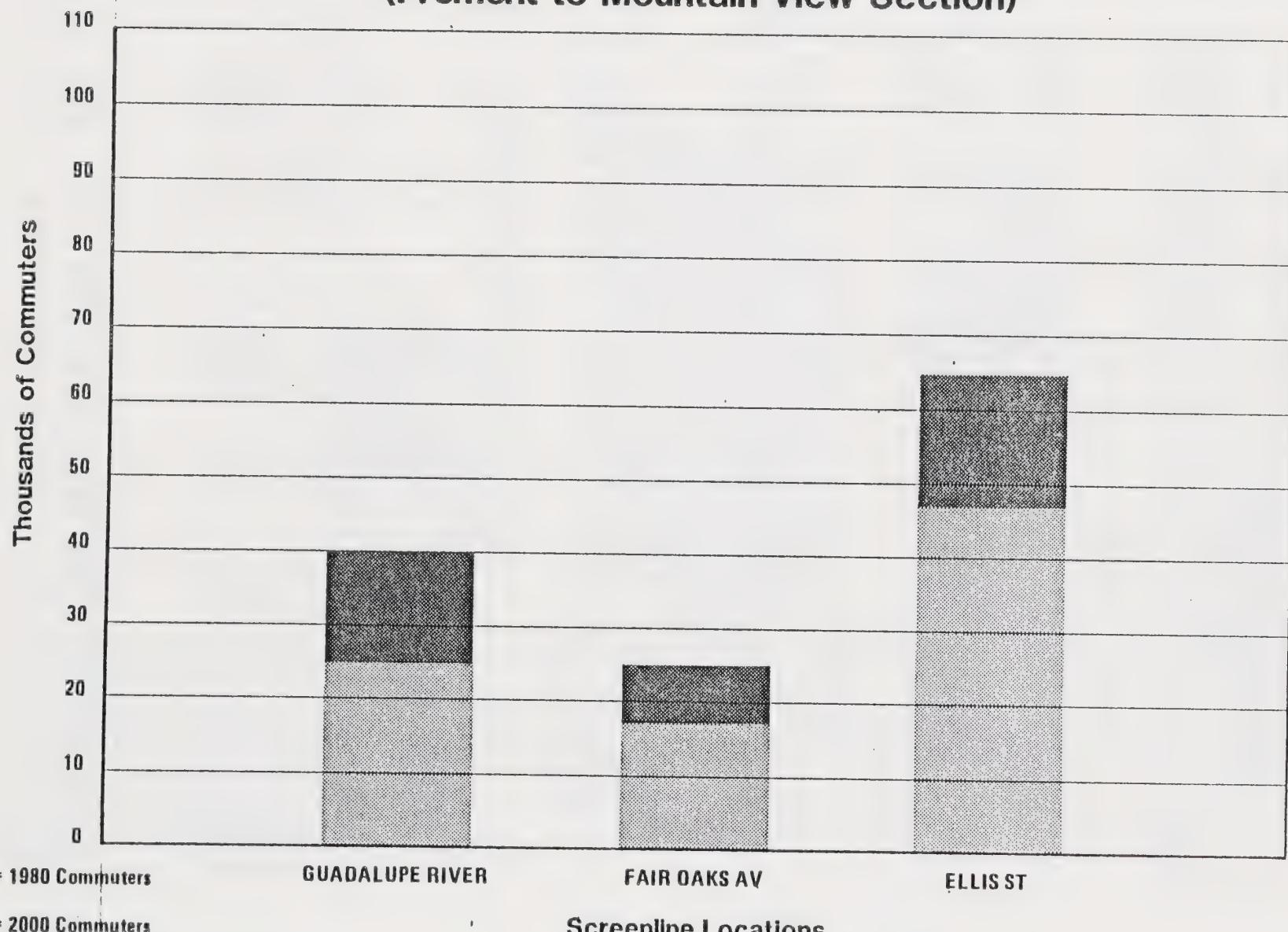
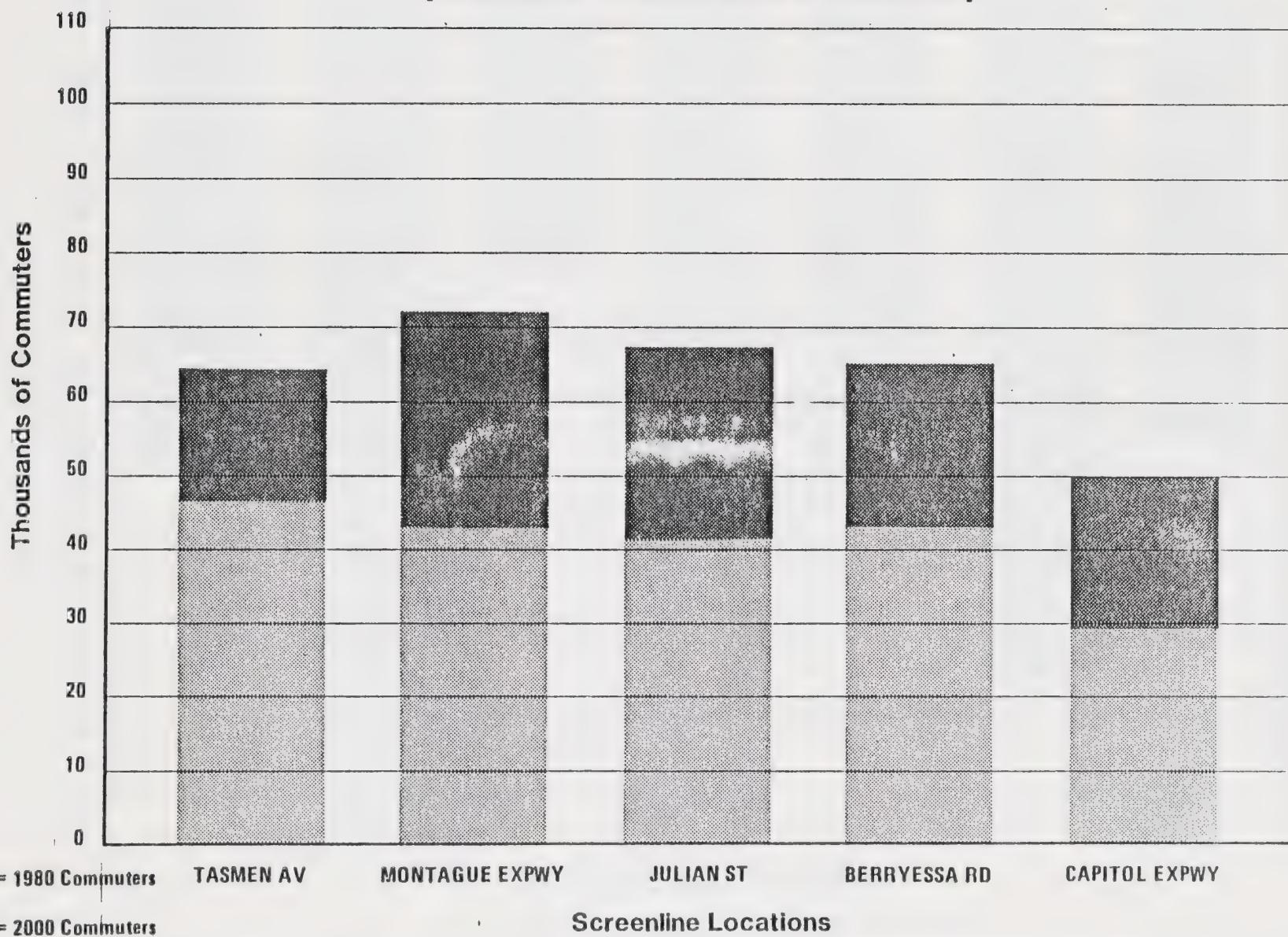


Figure - 19

**2b- Fremont to Southbay Corridor
(Fremont to San Jose Section)**

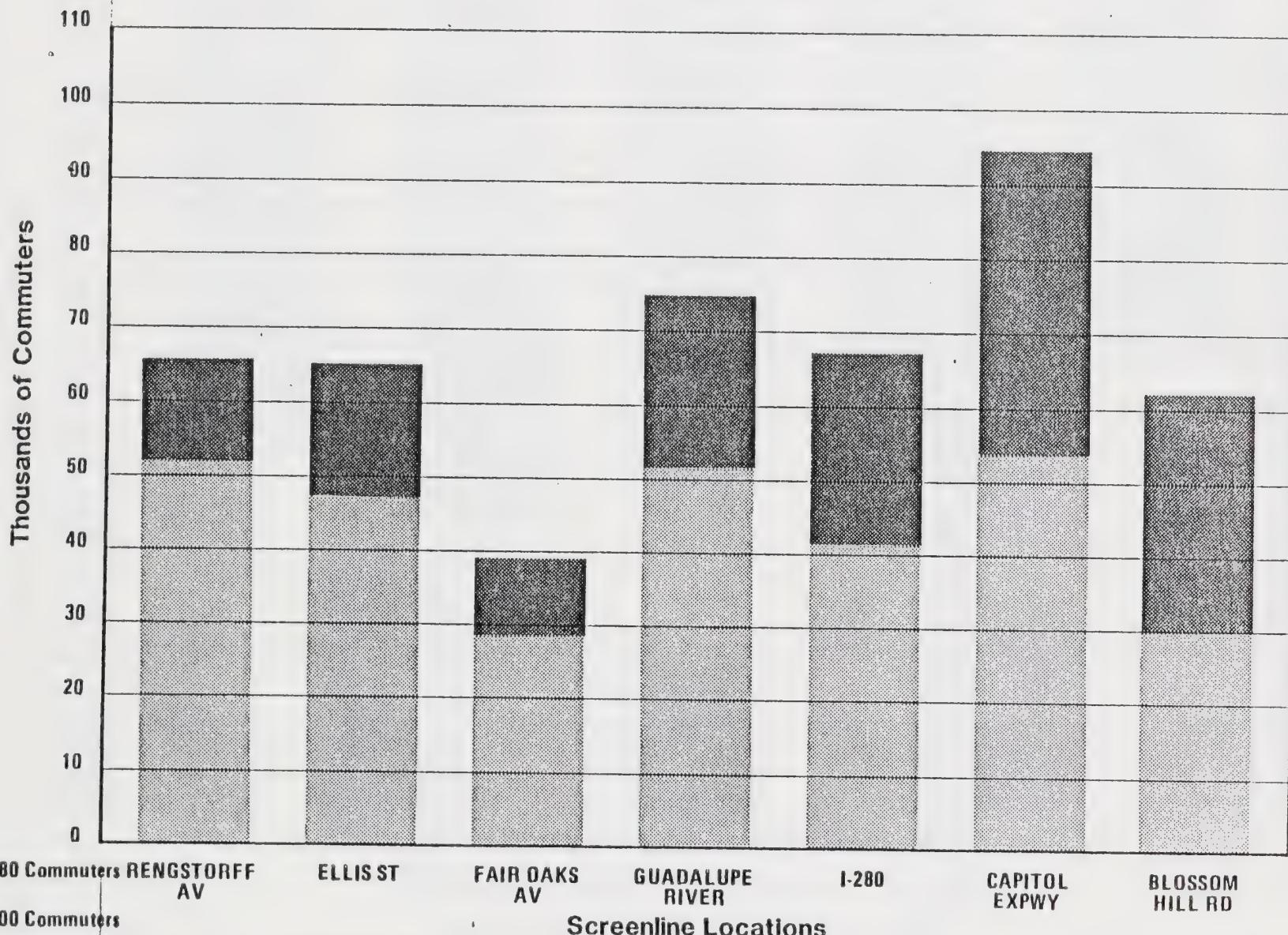


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COMMUTER TRAVEL GROWTH – SELECTED SCREENLINES

Figure - 20

3- US-101 Corridor

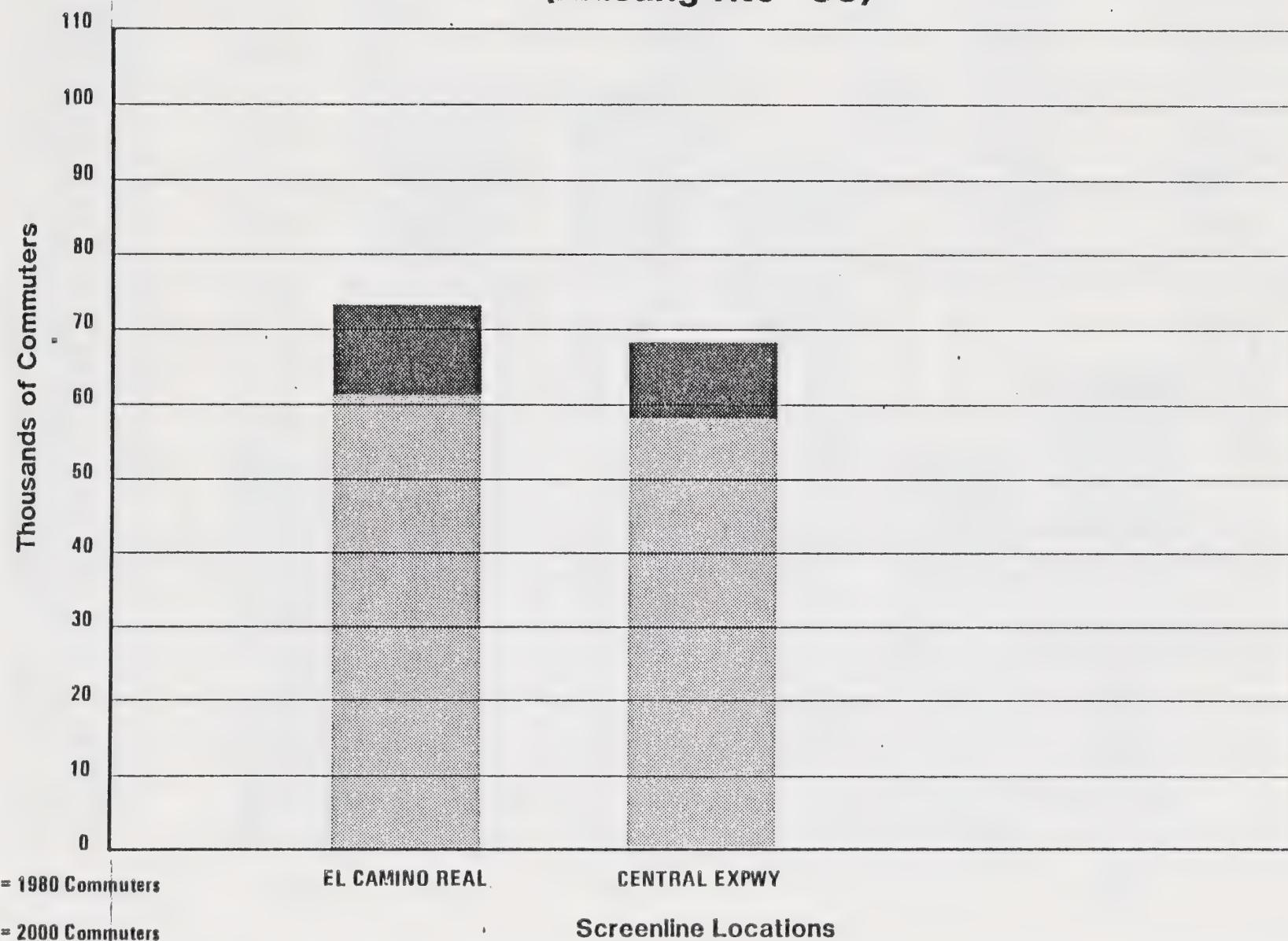


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COMMUTER TRAVEL GROWTH - SELECTED SCREENLINES

Figure - 21

**4- West Valley Corridor
(Existing Rte- 85)**



The existing Route 85 experiences congestion in the evening peak period on a regular basis. The commuter travel demand on Route 85 is expected to increase by about 11,700, or 19% by year 2000. As the remaining portion of the West Valley corridor does not exist, no comparison can be made with the 1980 level of commuter demand.

5. I-280 Corridor.

In terms of total travel for 1980 and year 2000, this corridor shows the highest commuter travel demand in total numbers as shown in Figure 22. The largest percentage increase of 44% or 28,800 occurs between Lincoln and North First Street. The large range of variation in increases is due to the fact that this corridor collects and distributes traffic to a number of other transportation facilities.

Prolonged congestion on different sections of I-280 is an everyday occurrence during the peak periods in the morning and evening. The West Valley corridor, once constructed, will relieve part of the congestion as a certain portion of existing Route 85 traffic will continue south rather than adding to I-280.

6. Route 17 Corridor.

The busiest section in terms of commuter travel demand lies between Route 237 and Montague Expressway for both 1980 and the year 2000. The largest increase (68%) also occurs at the same screenline in the year 2000. This section of Route 17 is severely congested; an increase of this magnitude will only worsen the situation if no additional capacity is added in the corridor.

7. East San Jose Corridor.

Due to its configuration, this corridor was divided into two sub-corridors in order to analyze the commuter travel increases between 1980 and the year 2000.

a) North-South Travel Section.

The north-south commuter travel demand was analyzed in this sub-corridor as shown in Figure 24. The selected check points (screenlines) were at Berryessa, Julian and Capitol Expressway. The largest increase (64%) occurs at the Julian Street screenline.

I-680 and Capitol Avenue/Capitol Expressway are the major roadways in this corridor. Although I-680 is not at capacity presently, the anticipated demand will contribute to reaching that level by Year 2000.

b) East-West Travel Section.

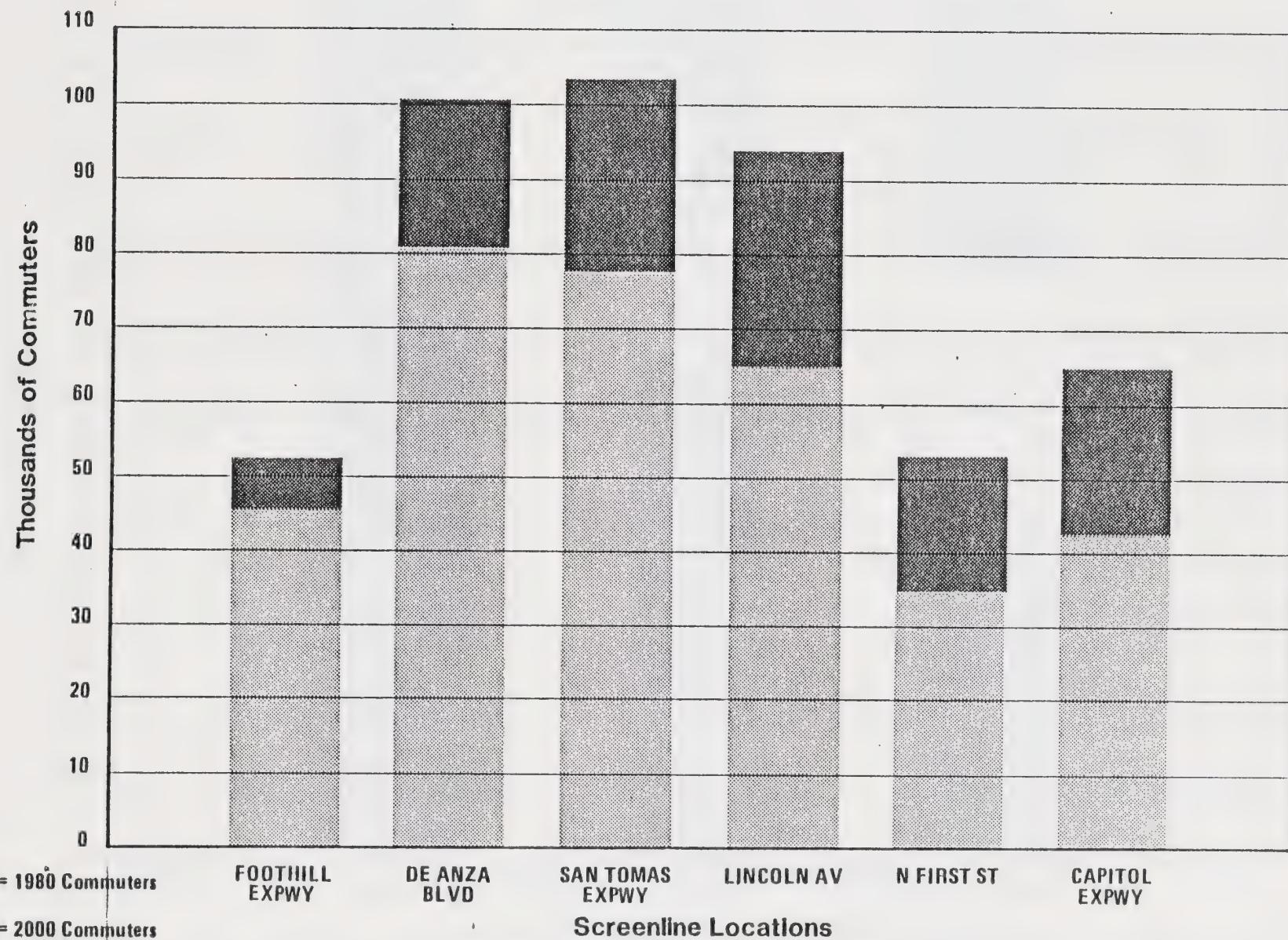
The east-west travel section of the corridor includes three screenlines at U.S. 101, North First Street and Lincoln Avenue. In terms of percentage increase, the largest growth (54%) occurs at North First Street. However, the commuter demands at Lincoln Avenue are significantly higher (28,800) from 1980 to the year 2000 as shown in Figure 25. This amounts to a 44% increase which will create severe congestion along the corridor.

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COMMUTER TRAVEL GROWTH – SELECTED SCREENLINES

Figure - 22

5- I-280 Corridor

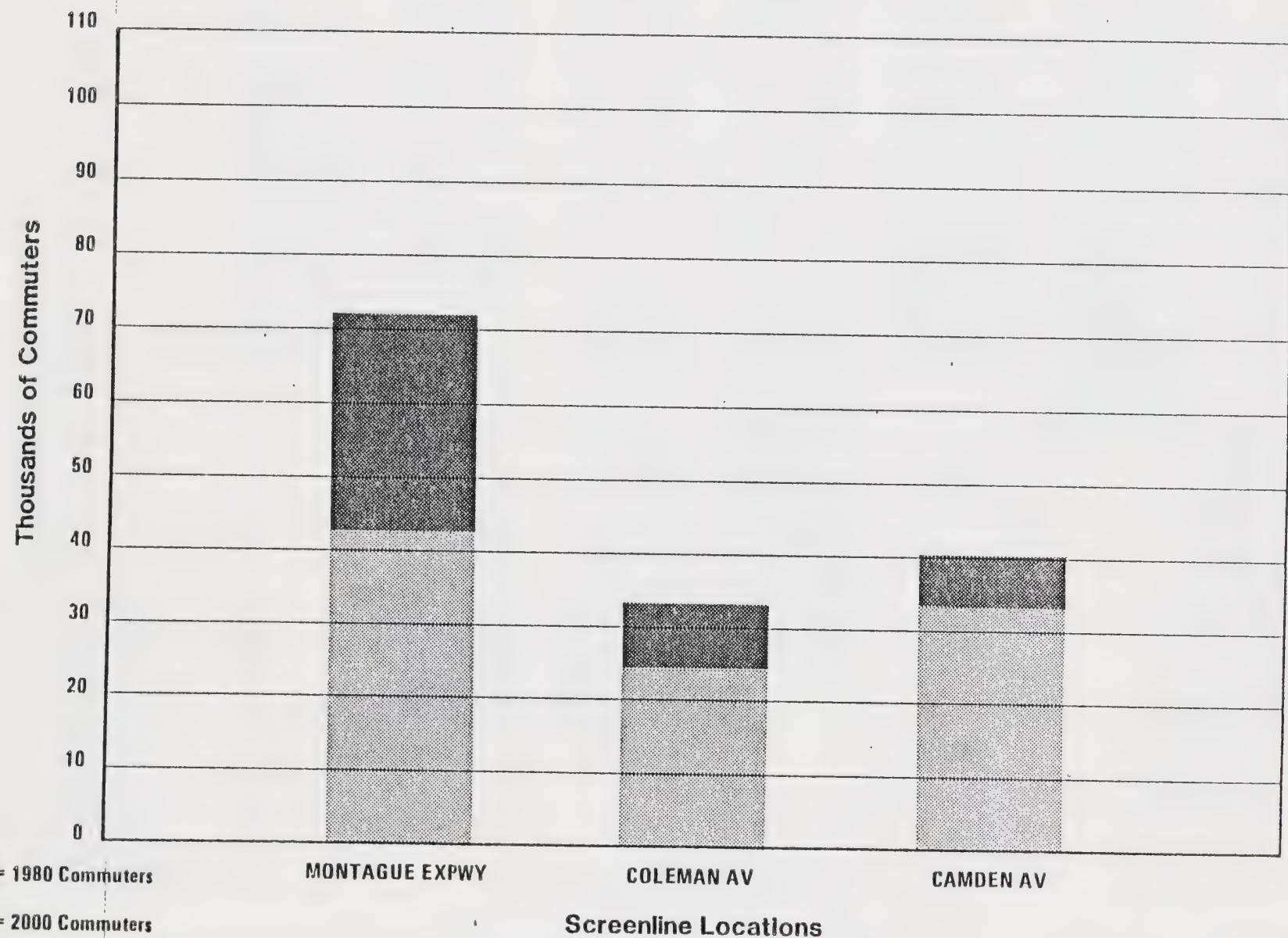


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COMMUTER TRAVEL GROWTH – SELECTED SCREENLINES

Figure - 23

6- Rte -17 Corridor

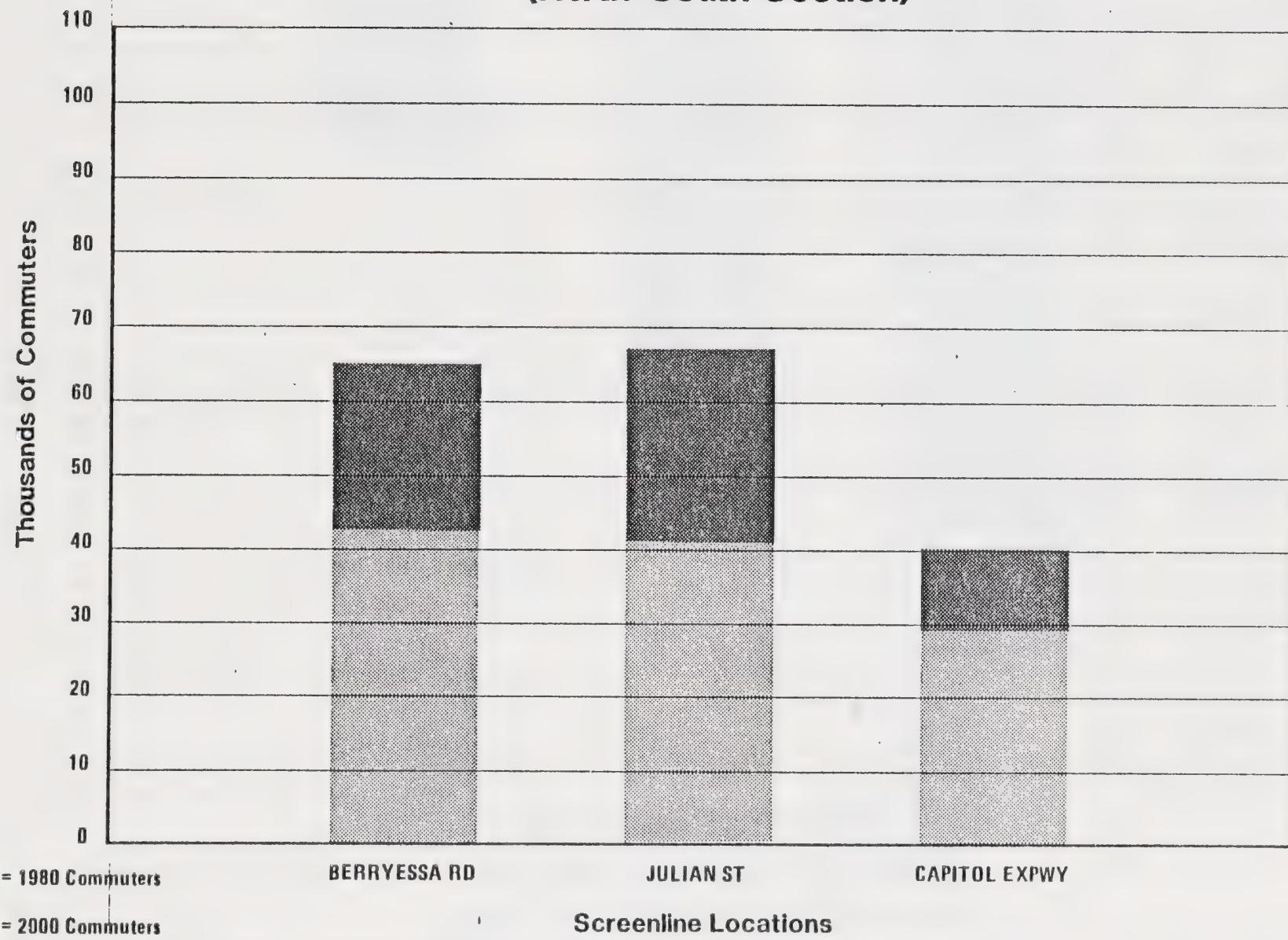


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COMMUTER TRAVEL GROWTH – SELECTED SCREENLINES

Figure - 24

**7a- East San Jose Corridor
(North-South Section)**

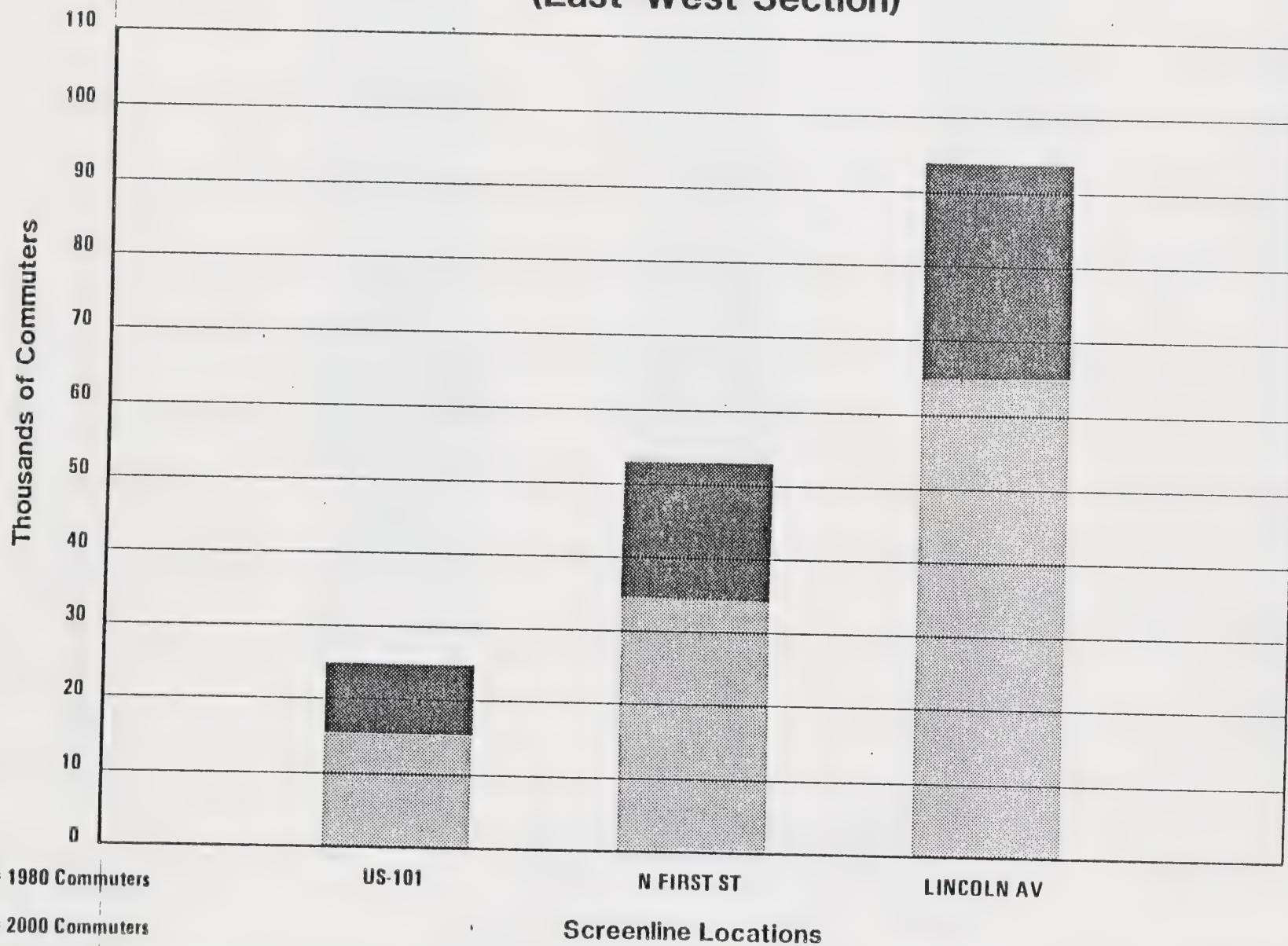


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COMMUTER TRAVEL GROWTH – SELECTED SCREENLINES

Figure - 25

**7b- East San Jose Corridor
(East-West Section)**



8. North-South Corridor.

The north-south corridor lies in the mid-part of the urbanized area of Santa Clara County. The largest part of the commuter travel occurs between U.S. 101 and I-280. However, the maximum percentage increase (38%) takes place at the U.S. 101 screenline as shown in Figure 26.

The existing north-south facilities are operating at capacity. Further addition of commuter travel in this corridor will severely impact commuter travel time on the roadway facilities.

9. South County Corridor.

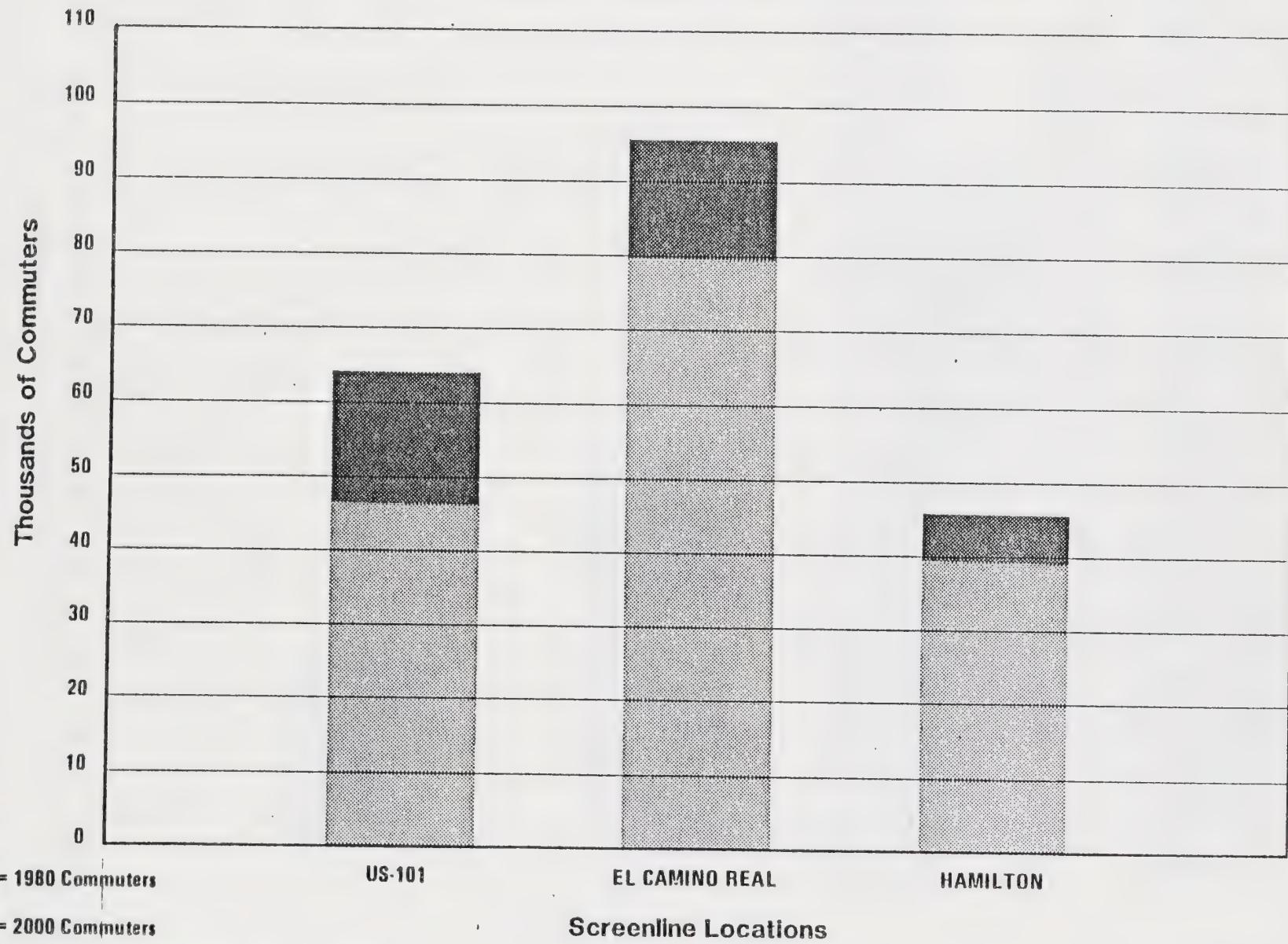
This corridor covers the most sparsely populated urbanized area in Santa Clara County starting at Bernal Road and terminating south of Gilroy. According to the commuter demand forecast, this corridor is expected to grow by 93%, a very large increase. It should be noted that this growth does not take into consideration the proposed development of North Coyote Valley however. The Bailey Avenue Commuter increase is shown in Figure 27.

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COMMUTER TRAVEL GROWTH – SELECTED SCREENLINES

Figure - 26

8- North-South Corridor

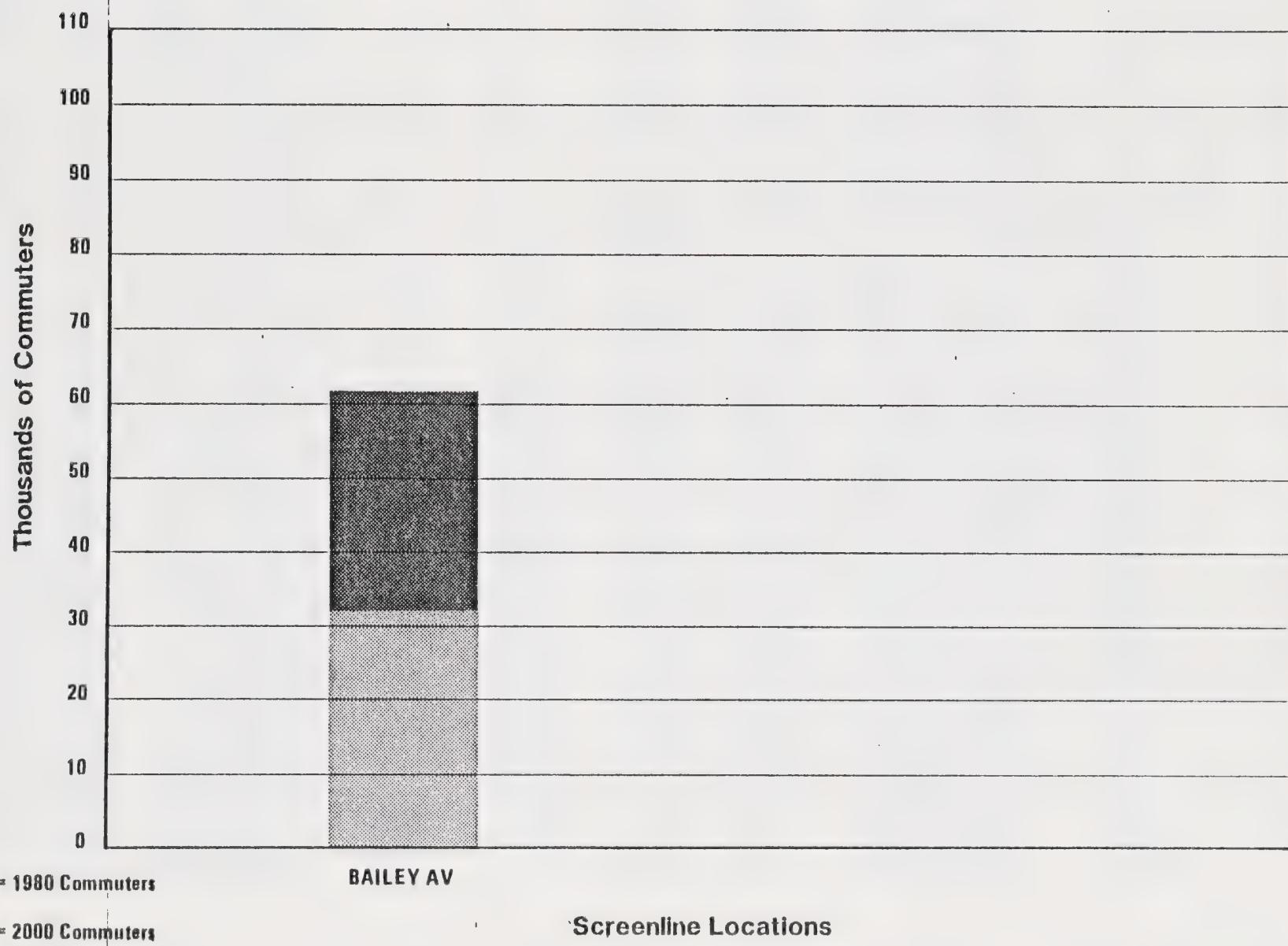


Barton-Aschman Associates, Inc.

COMMUTER TRAVEL GROWTH – SELECTED SCREENLINES

Figure - 27

9- South County Corridor



Without accounting for the North Coyote Valley development

4.

PRELIMINARY COMMUTER CORRIDOR TRAVEL DEMAND AND CAPACITY ANALYSIS FOR 1980 AND YEAR 2000

The 1980 to year 2000 commuter trip travel demands for each corridor were presented in the previous chapter. It is evident that all the corridors are expected to experience significant increases in the commuter travel to and from work.

To accomodate a portion of this growth, a number of transportation system improvements are in the planning and design stages within Santa Clara County. Recent passage of Measure "A" has ensured funding for the improvement of U.S. 101, I-280, S.R. 237 and the construction of S.R. 85 in the West Valley Corridor.

The primary purpose of this chapter is to compare the year 2000 travel demand with the capacity that will be available as a result of Measure "A" and other expected improvements and to determine what corridor capacity shortfall will remain in the year 2000.

It should be noted that this analysis is based on aggregated travel data and skeleton transportation facility network and it should not be construed as the final results of this study. Detailed travel forecasting will be conducted under Task 4A.

TRAVEL DEMAND ESTIMATES

At the time of this analysis, the available travel data consisted of the following:

- o 1980 Commuter Trips
- o 1980 24 Hour Person Trips
- o 1980 AM Peak Hour (Home-based work) Person Trips
- o 2000 Commuter Trips

As the year 2000 AM peak hour (home-based work) person trip table was not yet available, it was decided to factor the 1980 AM peak hour home-based person trip assignment to estimate the year 2000 AM peak hour trip assignment. The growth factors used for these projections were derived from the growth of "commuters" from 1980 to year 2000 for each corridor at each screenline reported in Chapter 3. This approach, although simplistic, is considered to be better than using a single (countywide) factor to convert year 2000 commuters to AM peak hour home-based work trips.

It should be noted that year 2000 trip table was developed using the ABAG's Projections 83 land use data which significantly under reported year 2000 employment projections for Santa Clara County.

The year 2000 travel demand assignment was conducted for two different conditions. In the first case, year 2000 trips were assigned to the freeway system that did not include SR 85 in West Valley Corridor. The second assignment included SR 85 in the West Valley Corridor.

CAPACITY ANALYSIS

The capacity of major transportation facilities was based on the following assumptions:

Freeway Capacity = 2200 vehicles per hour per lane
Expressway Capacity = 1980 vehicles per hour per lane

In the case of commuter or high occupancy vehicle lane capacity it was assumed that the vehicular capacity would be the same as the figures noted above, however usage of commuter lanes would depend on the number of persons sharing rides rather than the commuter lane capacity. The resulting "capacity" of the HOV lane were determined to be 15 percent higher than the above in terms of person trips accommodated. This analysis also considers minimal transit use.

CORRIDOR TRAVEL DEFICIENCIES

Corridor travel deficiencies were estimated for the following conditions:

1. 1980 AM peak hour demand versus the 1980 freeway and expressway system capacities.
2. Year 2000 AM peak hour demand versus the 1980 freeway and expressway system capacities.
3. Year 2000 AM peak hour demand versus the existing plus Measure "A" improvement of U.S. 101, I-280, SR-237 and the construction of SR 85 in West Valley Corridor as freeway lanes, and other expected highway improvements.
4. Year 2000 AM peak hour demand versus the existing plus Measure "A" improvements of U.S. 101, I-280, SR-237 to be used for commuter lanes only, the construction of SR 85 with commuter lanes, and other expected highway improvements.

For the four system scenarios listed above, the AM peak hour home-based work trips were assigned to the skeleton (freeway & expressway) network and their lane capacities were compared with the travel demand in terms of volume/capacity ratios.

The results of this analysis are listed in Tables 1 through 4. In cases where the volume/capacity ratio is 1.0 or above at the screenline analyzed, that screenline location is considered to be capacity deficient.

Volume/Capacity ratio of 1.0 reflects total breakdown, stop-and-go operation where as a ratio of 0.90 to 0.99 indicates severe congestion with some long-standing queues on critical sections. Similarly a ratio of 0.80 to 0.89 shows significant congestion on critical sections but the facility is functional and a ratio of less than 0.7 depicts uncongested operations.

In summary, the corridor travel deficiencies are these:

- Existing (1980) travel demand exceeds 1980 road system capacity in almost every corridor.
- Future (2000) travel demands would greatly overload the existing (1980) transportation system. Every corridor would face grid lock conditions during peak travel periods.
- If Measure "A" and other planned highway improvements are constructed, the U.S. 101 and Fremont to South Bay corridors will continue to face serious capacity deficiencies. I-280 will be relieved somewhat by the extension of SR 85 but will still face a significant capacity shortfall. Therefore highway improvements by themselves will not satisfy Year 2000 travel demands.
- If commuter lanes are constructed on each of the new or expanded highway facilities, the situation will improve somewhat but severe congestion will continue to be experienced on many county freeway and expressway links.

It can thus be concluded that a significant gap in transportation supply versus demand will exist in Year 2000 unless investments are made to further expand the highway and/or public transportation systems of the county. Alternatives for these transportation investments are presented in Working Paper 2.

TABLE 1

VOLUME/CAPACITY RATIOS FOR:
1980 TRAVEL DEMAND ON 1980 ROAD SYSTEM

Corridor	Screenlines At:	Volume/Capacity
1 - Guadalupe	Montague	1.47
	I-280	2.46
	Capitol Expwy	1.42
2A - Fremont — So. Bay	Guadalupe River	0.94
	Fair Oaks	1.02
	Ellis/Middlefield	1.73
2B - Fremont — So. Bay	Tasman	1.47
	Montague	1.47
	Berryessa	0.67
	Julian	1.40
	I-280	2.45
3 - U.S. 101	Rengstorff	1.18
	Ellis	1.04
	Fair Oaks	0.62*
	Guadalupe River	1.12
	I-280	1.35
	Capitol Expwy	1.03
	Blossom Hill	0.62*
4 - West Valley	Central Expwy	0.87
	El Camino Real	0.90
5 - I-280	Foothill	0.74
	De Anza	1.81
	San Tomas	1.71
	Lincoln	0.76*
	First	0.86*
	Capitol Expwy	0.62*
6 - Hwy 17	Montague	0.88
	Coleman	0.96
	Camden	1.16
7A - E. San Jose	U.S. 101	0.22*
	Julian	0.70*
	Capitol Expwy	0.42*
7B - E. San Jose	U.S. 101	0.22*
	First	0.50*
	Lincoln	1.44*
8 - North - South	U.S. 101	0.69*
	El Camino Real	0.98*
	Hamilton	0.64*
9 - So. County	Bailey	0.62*

* Traffic at surrounding screenlines will back up to increase V/C ratio above 1.0

TABLE 2

VOLUME/CAPACITY RATIOS FOR:
(YEAR 2000 TRAVEL DEMAND ON 1980 ROAD SYSTEM)

Corridor	Screenlines At:	Volume/Capacity
1 - Guadalupe	Montague	2.48
	I-280	3.51
	Capitol Expwy	1.94
2A - Fremont - So. Bay	Guadalupe River	1.51
	Fair Oaks	1.48
	Ellis/Middlefield	2.40
2B - Fremont - So. Bay	Tasman	2.48
	Montague	2.48
	Berryessa	1.07
	Julian	2.20
	I-280	4.28
3 - U.S. 101	Rengstorff	1.48
	Ellis	1.44
	Fair Oaks	0.86*
	Guadalupe River	1.64
	I-280	2.20
	Capitol Expwy	1.73
	Blossom Hill	1.22
4 - West Valley	Central Expwy	1.04
	El Camino Real	1.05
5 - I-280	Foothill	0.85
	De Anza	2.26
	San Tomas	1.53
	Lincoln	2.22
	First	0.66*
	Capitol	0.95
6 - Hwy 17	Montague	1.15
	Coleman	1.65
	Camden	1.41
7A - E. San Jose	Berryessa	1.07
	Julian	1.15
	Capitol	0.73*
7B - E. San Jose	U.S. 101	0.36*
	First	0.78*
	Lincoln	2.09
8 - North - South	U.S. 101	0.96
	El Camino Real	1.18
	Hamilton	0.75*
9 - So. County	Bailey	1.14

* Traffic at surrounding screenlines will back up to increase V/C ratio above 1.0

TABLE 3

VOLUME/CAPACITY RATIOS FOR: YEAR 2000 TRAVEL DEMAND
ON 1980 SYSTEM PLUS MEASURE A IMPROVEMENTS AS FREEWAY LANE

Corridor	Screenlines At:	Volume/Capacity
1 - Guadalupe	Montague	1.24
	I-280	3.51
	Capitol	1.03
2A - Fremont - So. Bay	Guadalupe River	0.91 **
	Fair Oaks	0.89 **
	Ellis/Middlefield	1.44
2B - Fremont - So. Bay	Tasman	1.24
	Montague	1.24
	Berryessa	1.10
	Julian	1.07
	I-280	4.28
3 - U.S. 101	Rengstorff	1.11
	Ellis	1.08
	Fair Oaks	0.64 *
	Guadalupe River	1.23
	I-280	1.10
	Capitol	1.53
	Blossom Hill	1.07
4 - West Valley	Central Expwy	0.85 *
	El Camino Real	0.84 *
5 - I-280	Foothill	0.85
	De Anza	1.19
	San Tomas	1.37
	Lincoln	1.41
	First	0.63
	Capitol	0.95
6 - Hwy 17	Montague	0.57
	Coleman	1.65
	Camden	1.20
7B - E. San Jose	U.S. 101	0.36 *
	First	0.75
	Lincoln	1.88
7A - E. San Jose	Berryessa	1.15
	Julian	1.15
	Capitol	0.73 *
8 - North - South	U.S. 101	0.68
	El Camino Real	0.89
	Hamilton	0.39

** Due to heavy directional flow of traffic the V/C ratio will exceed 1.0.

TABLE 3 (Continued)

VOLUME/CAPACITY RATIOS FOR: YEAR 2000 TRAVEL DEMAND
ON 1980 SYSTEM PLUS MEASURE A IMPROVEMENTS AS FREEWAY LANE

Corridor	Screenlines At:	Volume/Capacity
9 - So. County	Bailey	1.00
10 - South Valley	Prospect	0.67
	Winchester	0.72
	Camden	0.61
	Snell	0.64

* Traffic at surrounding screenlines will back-up to increase V/C ratio above 1.0.

TABLE 4

VOLUME/CAPACITY RATIOS FOR: YEAR 2000 TRAVEL DEMAND
ON 1980 SYSTEM PLUS MEASURE A IMPROVEMENTS AS COMMUTER LANES

Corridor	Screenlines At:	Volume/Capacity
1 - Guadalupe	Montague	0.80
	I-280	3.51
	Capitol Expwy	1.03
2A - Fremont - So. Bay	Guadalupe River	0.87**
	Fair Oaks	0.85**
	Ellis/Middlefield	1.37
2B - Fremont - So. Bay	Tasman	0.80
	Montague	0.80
	Berryessa	1.07
	Julian	0.71*
	I-280	4.28
3 - U.S. 101	Rengstorff	1.07
	Ellis	1.04
	Fair Oaks	0.62*
	Guadalupe River	1.18
	I-280	1.06
	Capitol Expwy	1.47
	Blossom Hill	1.03
4 - West Valley	Central Expwy	0.83
	El Camino Real	0.82
5 - I-280	Foothill	0.82
	De Anza	1.15
	San Tomas	1.32
	Lincoln	1.36
	First	0.63
	Capitol Expwy	0.95
6 - Hwy 17	Montague	0.55*
	Coleman	1.65
	Camden	1.20
7A - East San Jose	Berryessa	1.07
	Julian	1.15
	Capitol Expwy	0.73*
7B - East San Jose	U.S. 101	0.96
	Lincoln	1.25
	First	1.13
8 - North - South	U.S. 101	0.65*
	El Camino Real	0.85
	Hamilton	0.37

** Due to heavy directional flow of traffic the V/C ratio will exceed 1.0.

TABLE 4 (Continued)

VOLUME/CAPACITY RATIOS FOR: YEAR 2000 TRAVEL DEMAND
ON 1980 SYSTEM PLUS MEASURE A IMPROVEMENTS AS COMMUTER LANES

Corridor	Screenlines At:	Volume/Capacity
9 - So. County	Bailey	0.96*
10 South Valley	Prospect	0.64
	Winchester	0.68
	Camden	0.58
	Snell	0.61

* Traffic at surrounding screenlines will back up to increase V/C ratio above 1.0.

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